EXHIBIT A

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(54) **HANDHELD WATER MISTING FAN WITH IMPROVED AIR FLOW**

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B01F 3/04 (2006.01)

(52) **U.S. Cl.** **261/28**; 261/89; 239/289

(58) **Field of Classification Search** ..... 261/28, 261/89, 90, DIG. 3, DIG. 43; 239/289, 290
See application file for complete search history.

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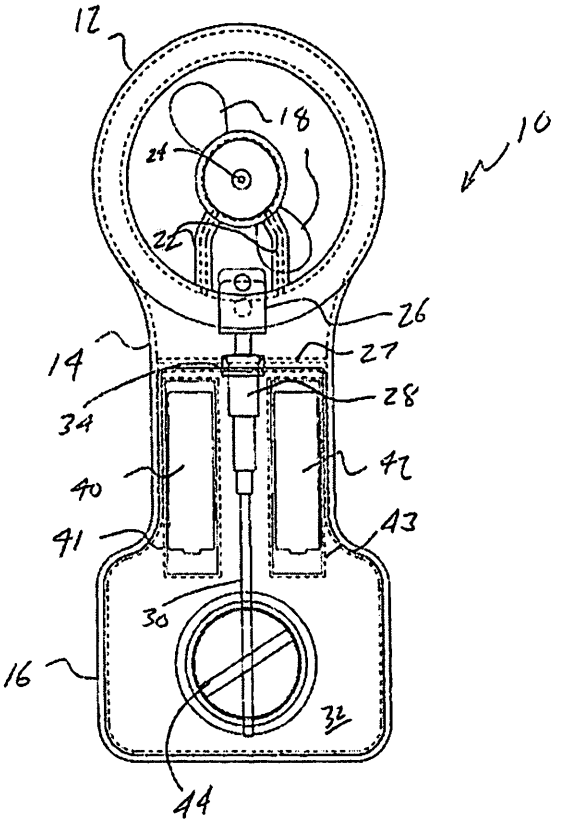
(57) **ABSTRACT**

The present invention is directed to an improved handheld water misting fan device wherein the power source compartment is positioned within the device at a location remote from the fan motor thereby to remove any structure from the area bounded by the fan shroud. The relocation of the power source compartment leaves the area bounded by the shroud substantially unobstructed thereby to improve air flow. The device is formed in a dog bone shaped configuration to provide a narrow handle section for improved grippability, and an enlarged fluid reservoir at the lower end thereof for greater reservoir capacity.

8 Claims, 8 Drawing Sheets



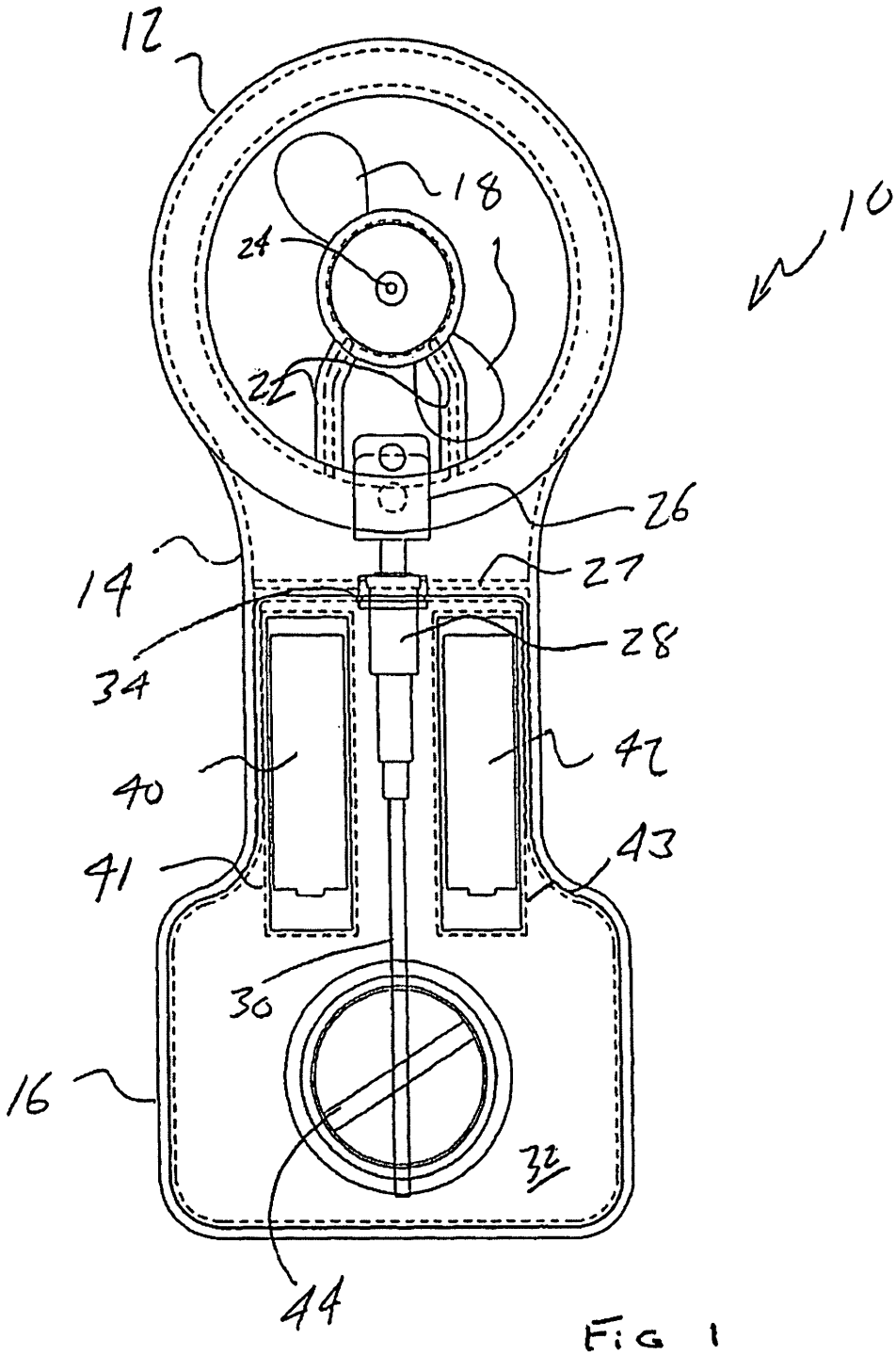


Fig 1

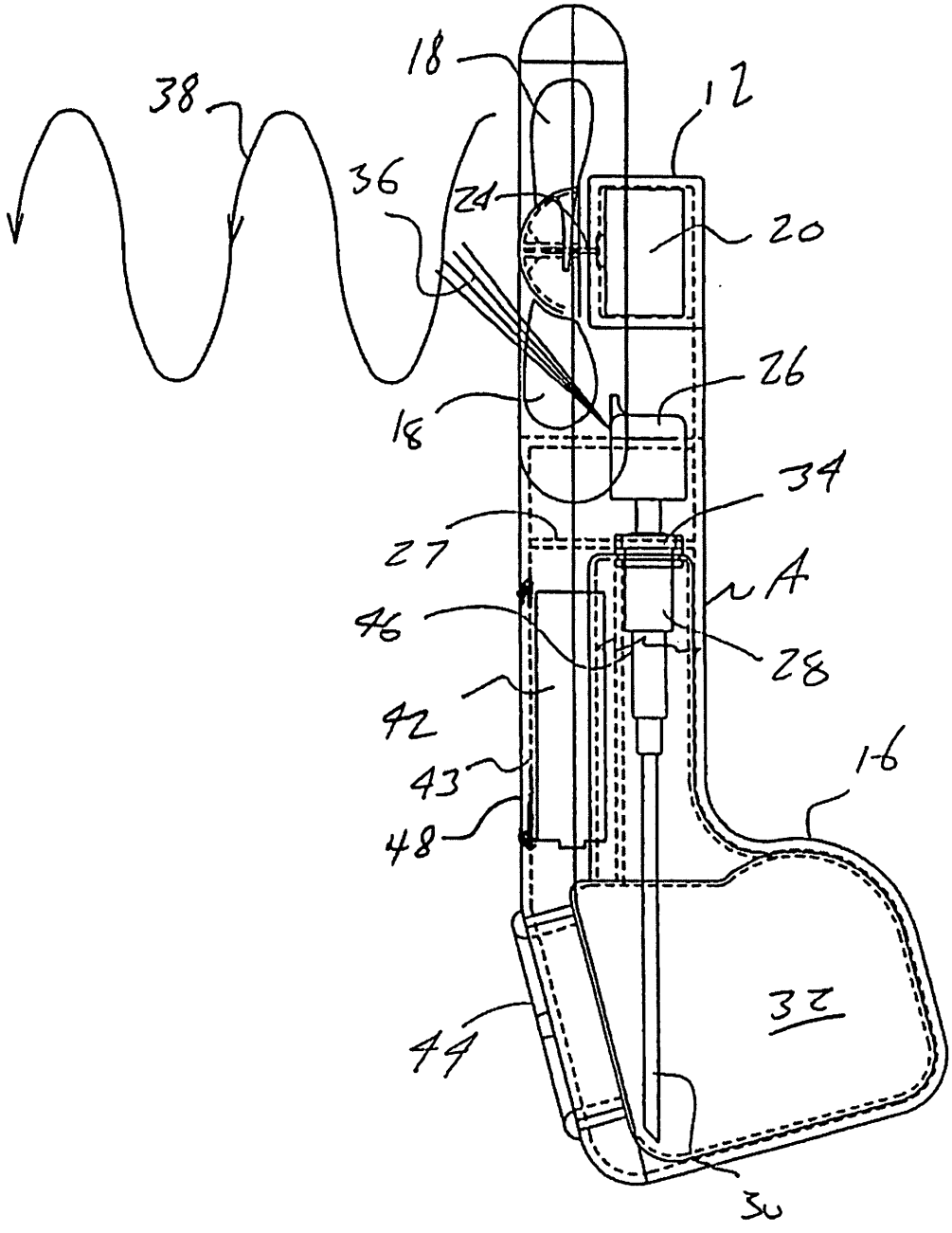


Fig 2

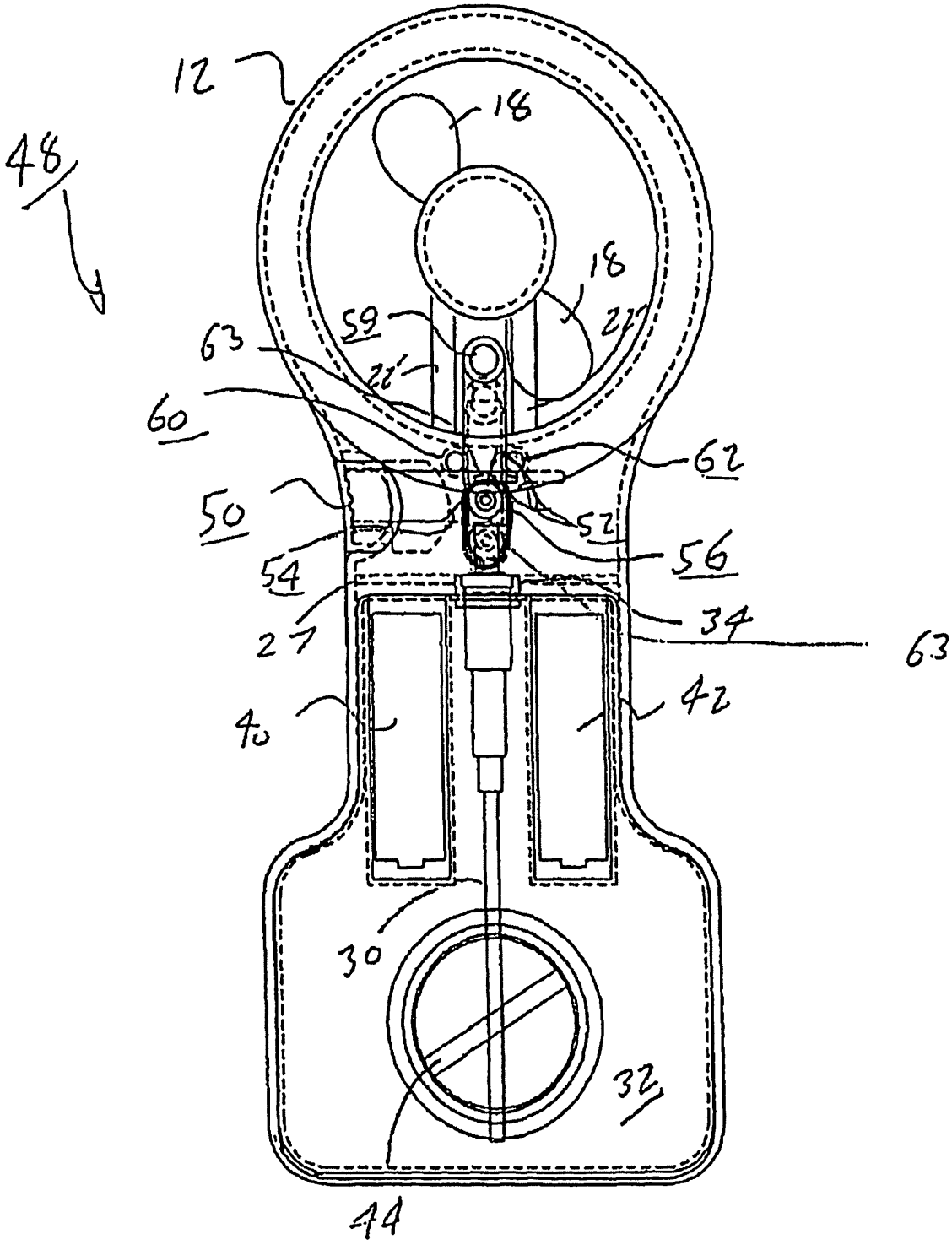


Fig 3

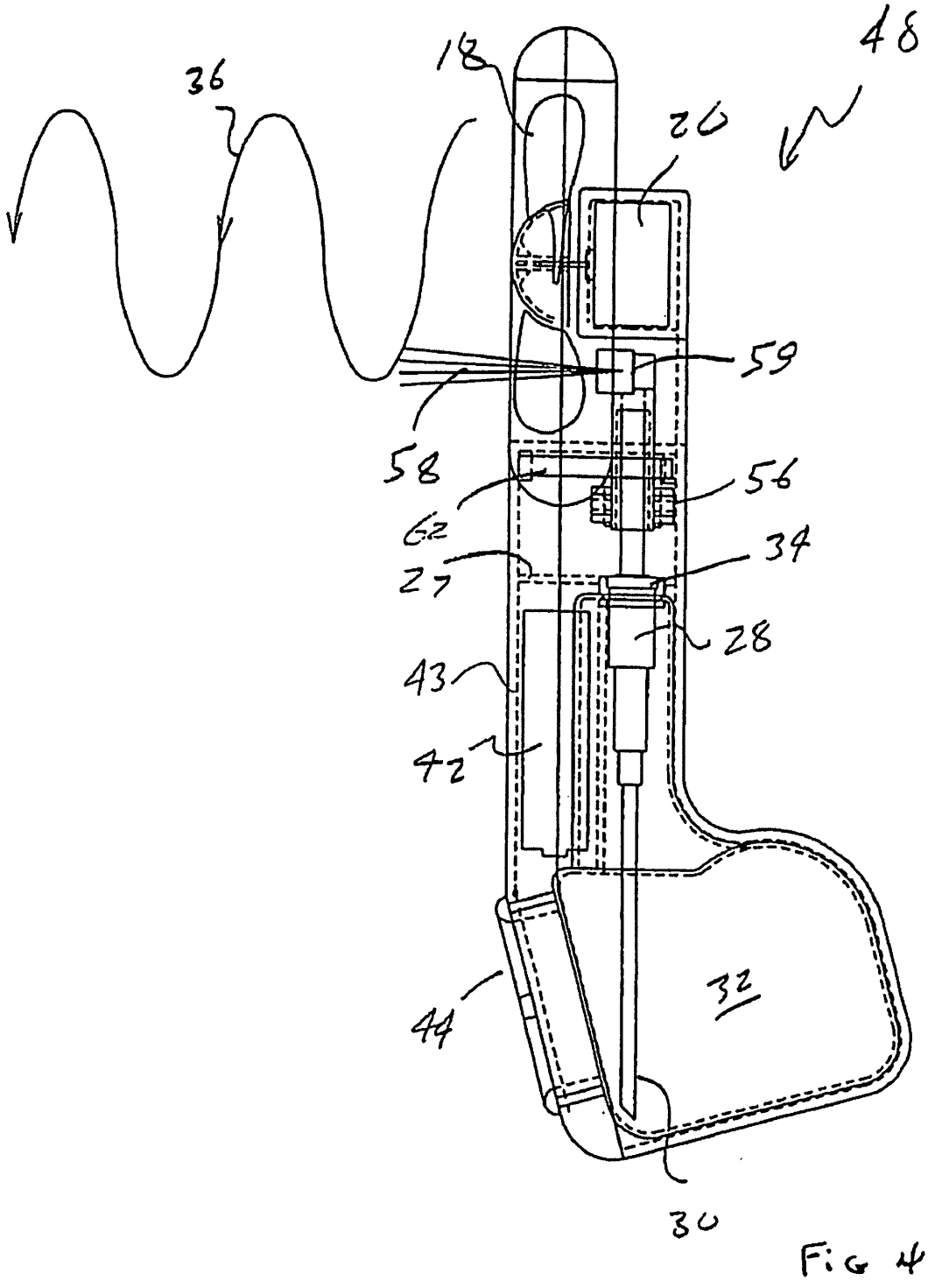


Fig 4

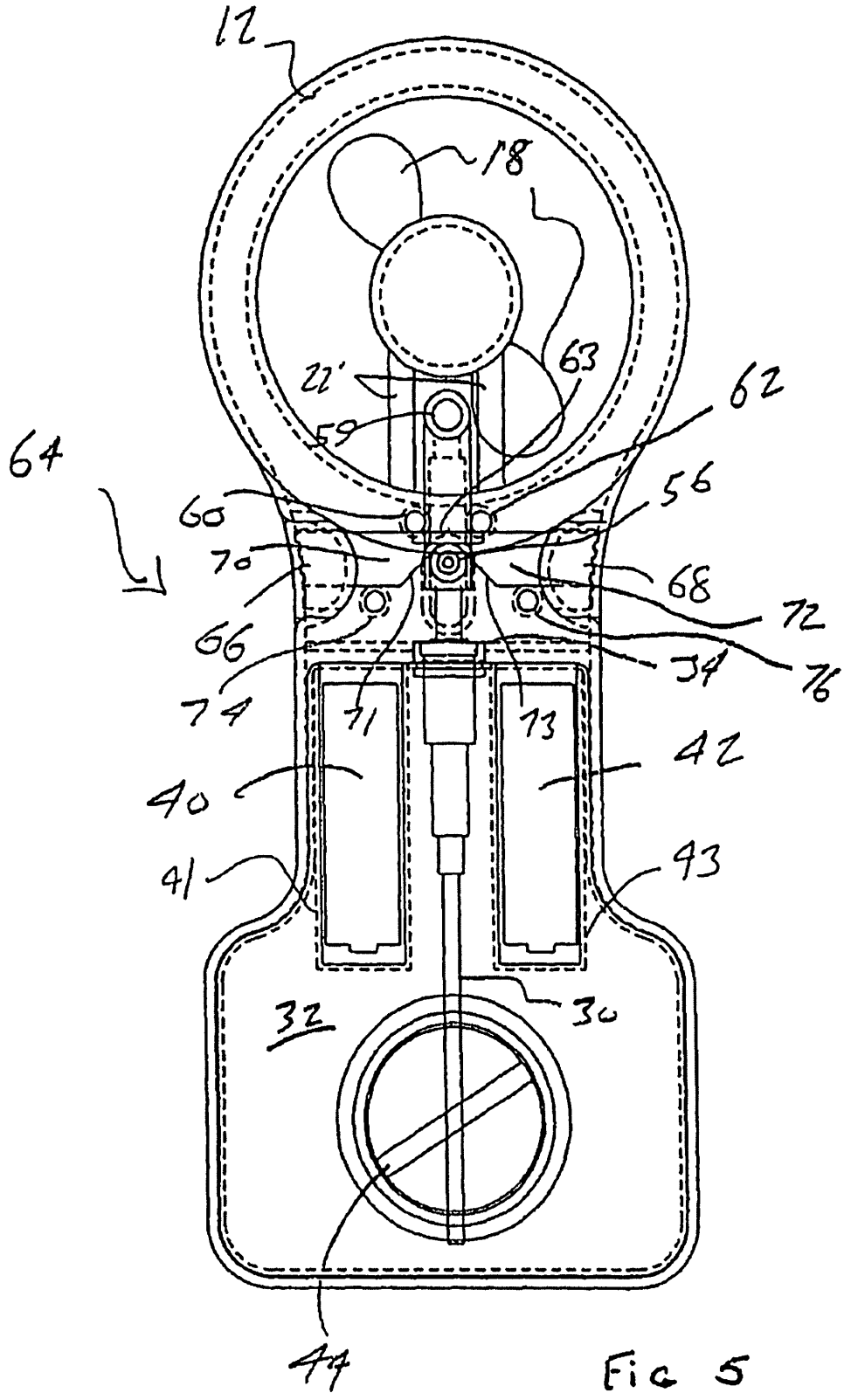

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Fig 5

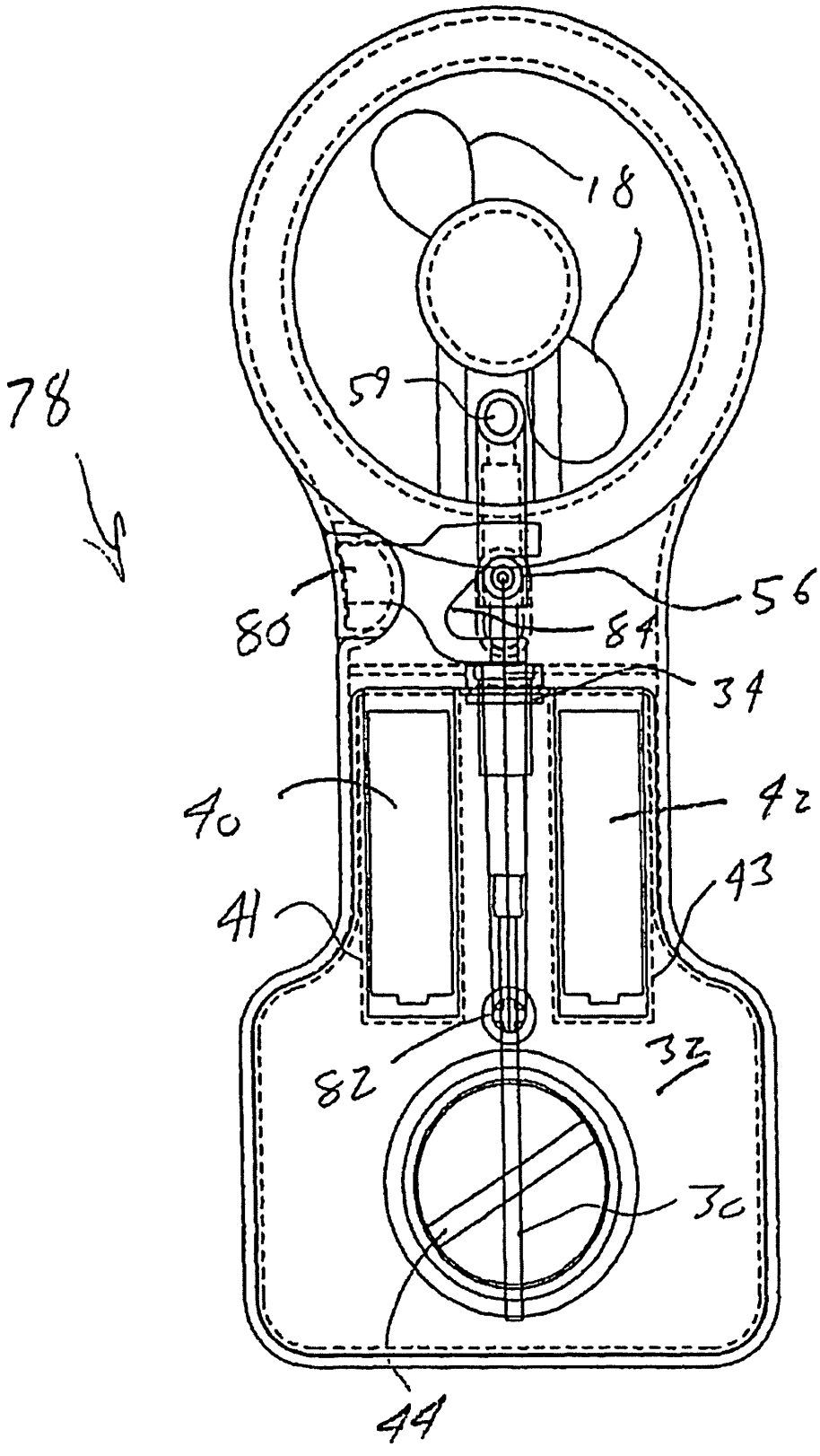

Fig 6

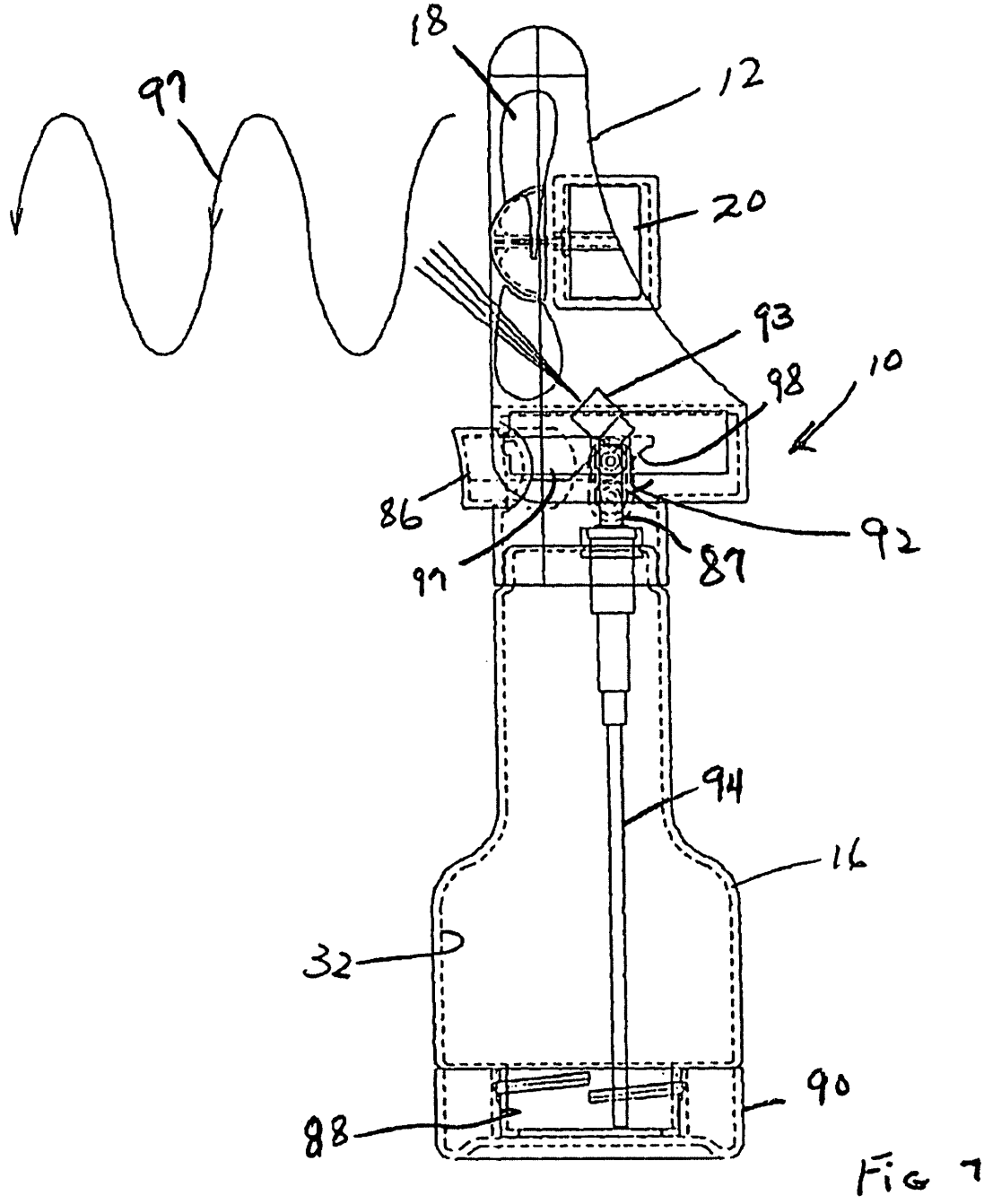

Fig 7

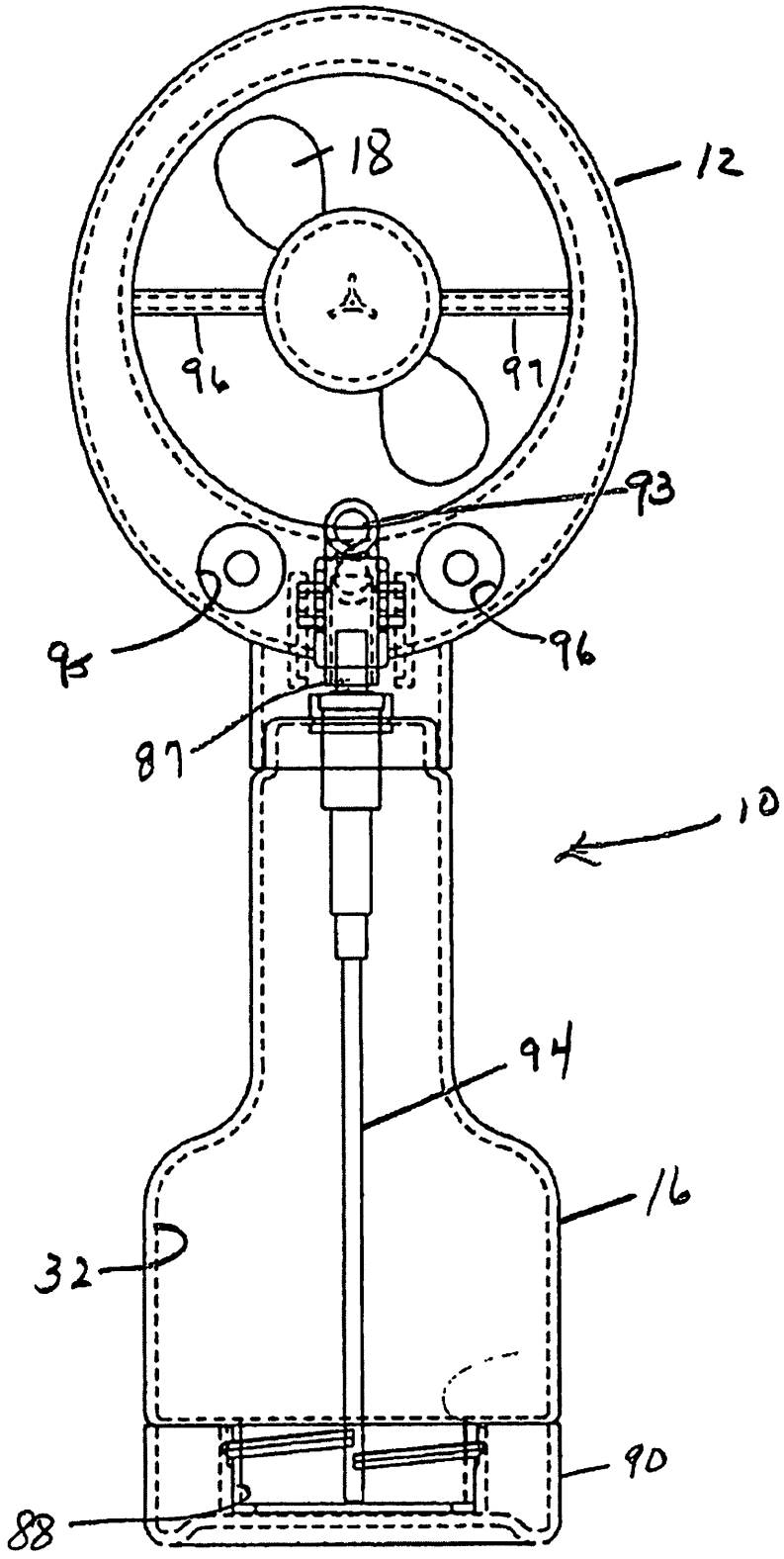

Fig 8

HANDHELD WATER MISTING FAN WITH IMPROVED AIR FLOW

I. FIELD OF THE INVENTION

The present invention discloses an improved handheld water misting fan. More specifically, the present invention discloses a handheld version misting fan both rugged in construction and more stylish than conventional handheld water misting fan. The present invention improves upon one or more of the features which include air flow, fluid volume of the reservoir and grippability.

II. BACKGROUND OF THE RELEVANT ART

The water misting fan is a device for providing personal and environmental cooling by spraying atomized water droplets into an air stream. The droplets evaporate thereby drawing heat out of the surrounding air. Non-evaporated droplets impinge on the user and further evaporation draws heat out of clothing and skin of the user or surrounding surfaces. These are sometimes called "swamp coolers". For the benefit of the cooling, the cost is increased humidity, which can decrease comfort. Swamp coolers work poorly in confined or very humid environments and are more suited to hot, but low humidity, environments like the desert.

The utility of the device is improved by increasing the amount of water evaporated in the air stream as opposed to wetting the user and then trying to evaporate water off the skin and clothing. This is achieved by increasing the air flow and/or making water droplets smaller.

Portable units usually use a manually-actuated piston pump to generate the high pressures needed for fine atomization of the water. Portable water misting fans usually incorporate DC motors with dry cell batteries for portability.

In the art there are numerous instances of coupling a sprayer nozzle with a fan to produce an improved personal or environmental cooling apparatus. In the handheld realm, the portable misting fan described in Steiner '495 is the benchmark for the battery operated misting fans where a trigger or pushbutton operated sprayer discharges a fine mist of water into the air stream. These are typically single nozzle/single blower apparatuses.

In use, the user fills the reservoir through a fill port by removing the fill cap. Here, the port is large enough to accept ice cubes to keep the water in the reservoir cool. The user squeezes the pump trigger to manually pump water from the reservoir to moderate pressures through a narrow orifice on the nozzle. The water comes out as a spray of droplets. An electric motor driven fan is located proximate to the nozzle. There is typically an enclosure that surrounds the batteries, motor and pump body. Here the fan body is supported on the sprayer which, in turn, mounts to the top of the bottle. If the nozzle is located behind the fan blades, and the fan is turned on, the droplet spray will be directed into the air stream to be directed at the user and to enhance evaporation. The fan can be operated independently of the pump so the unit can act in a fan-only capacity.

In the case of designs such as Steiner '495, the water misting fan exhibits a problem with aesthetics and durability. Durability is an important feature because these products are sold for outdoor use and at amusement parks where they don't receive tender care. Also, as with any consumer good, the aesthetics are important to achieve greater customer satisfaction and commercialization of the product.

The durability problem comes from the interface between the reservoir, sprayer and the fan enclosure. At some point, there is a coupling between the motor enclosure and sprayer (further attached to the reservoir) or motor enclosure and reservoir that ends up being a weak link. The coupling has to be undone and reattached for various purposes of changing the batteries, filling the reservoir or removing the fan for separate use. If these couplings could be removed, the water misting fan could be made much more durable.

Further, conventional water misting fans have vulnerable triggers and attachment collars where the sprayer mates with the top of the bottle. These are two areas where the end user tends to break the misting fan. As such, the fan should be evaluated for its durability by evaluating how it performs in drop testing, how it holds up when packed away in a purse or beach bag, and the strength of its attachment points like straps and belt clips.

The aesthetic problem comes from the compromises of the separable component design. In the instance of portable bottle type misting fan designs, there is an unsightly, cheap-looking screw collar that detracts from the smooth lines of the fan head. Similarly, the use of the standard sprayer requires the use of the blocky nozzle and cheap-looking trigger that detract from the overall design. The design does not allow us to hide the chunky-looking sprayer and nozzle within the enclosure because of size and functional reasons. The grip is often uncomfortable because it is too large around for smaller hands or the weight is not well balanced.

What is lacking in the prior art is a water misting fan that can withstand the rigors of outdoor use while still looking sleek and stylish. The design should also store compactly and possess a minimum of parts that can be lost. Moving or wearing parts should be kept to a minimum. The handle or grippable feature of the enclosure should be narrow enough for smaller hands to grasp and the trigger should be located conveniently to the index finger and not pinch adjacent fingers.

Further, to be economical, the design should have a minimum number of seals and as many integrated components as possible, these using economical injection molding or blow molding to render the features. For performance, it has been found that a flexible fan blade without any guard in front or back provides better air flow without compromising user safety. A guard around the periphery of the impeller improves durability. Other considerations of the misting fan design should make efficient use of the space inside the enclosure, especially to maximize reservoir volume.

Further, it has now been determined that by re-locating the battery compartment to a location removed from air flow stream created by the impeller blade, air flow is improved. This is especially realized in the variation of the portable misting fan which includes a shroud surrounding the impeller blades which serves the function of protecting the impeller blades from breakage and protects the user from possible injury from the impeller blades.

The present device re-locates the battery compartment to a separate compartment which may be positioned in the base of the shroud, or to a separate compartment which may be formed in the wall of the reservoir.

The reservoir may be formed as a separate compartment which is then surrounded by a handle portion and includes an enlarged neck portion which extends outwardly from a bottom opening in the handle portion. The lower portion of the reservoir and surrounding handle portion is enlarged which serves a two-fold purpose of improving the fluid volume of

the reservoir and providing a dog-bone shaped configuration allowing for improved grippability.

IV. BRIEF DESCRIPTION OF DRAWINGS

Reference will now be made to the attached drawings, when read in combination with the following detailed description, wherein like reference numerals refer to like parts throughout the several views, and in which:

FIG. **1** is a front view of the water misting fan according to a preferred embodiment of the present invention and showing interior portions of the enclosure and reservoir in phantom;

FIG. **2** is a side view of the water misting fan shown in FIG. **1** and illustration in particular the upwardly angled nature of the nozzle generated mist stream in use with the rotating impeller elements;

FIG. **3** is a front view of a water misting fan according to a secondary embodiment illustrating an inwardly depressible actuator button for generating the mist spray according to the present invention;

FIG. **4** is a side view of the water misting fan according to FIG. **3** and illustrating the nozzle directing the mist from a rearward position;

FIG. **5** is a front view of the water misting fan according to a third embodiment incorporating a pair of opposingly and inward actuating buttons, either of which is actuable to issue a mist spray;

FIG. **6** is a front view of the water misting fan according to a still further variant illustrating a pivoting actuator button arrangement by which a cam surface is formed in an associated and inward guiding portion in order to downwardly deflect the spray nozzle;

FIG. **7** is a side elevational view in cross section illustrating an alternate embodiment of a fan device having the battery compartment located in the base of the shroud; and

FIG. **8** is a front elevational view partly in cross section showing the device of FIG. **7** and the positioning of the battery compartment in the base of the shroud.

VI. DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. **1**, a front view is shown at **10** of an improved water misting fan according to a first preferred embodiment of the present invention. As will be subsequently described, the illustrations provided herein consist of front and side views in two-dimension, and which show various internal components in phantom.

Referring again to FIG. **1**, as well as to the side view of FIG. **2**, a main body of the misting fan **10** is typically constructed of a one-piece and integral body and includes an upper shroud portion **12**, an intermediate neck portion **14** and a lower fluid reservoir holding portion **16**. Encased within the shroud is a rotating impeller (see pair of blades **18**) driven by a rearwardly mounted motor **20**. A pair of motor supports (or struts) **22**, see FIG. **1**, support the motor **20**. A pair of motor supports (or struts) **22**, see FIG. **1**, support the motor **20** and associated impeller, see further motor drive shaft **24** (FIG. **2**), and are configured to exhibit a minimal cross section so as to minimize impeding air flow to the rear side of the impeller blades **18**.

An actuator button **26** is illustrated at an intermediate mounting location, see interior shelf **27**, associated with the body interior and is accessible, from the rearward side of the open shroud **18**, and in order to be downwardly actuated (see to phantom illustration in FIG. **1**) in order to issue a mist spray. A misting assembly further includes a pump **28** and

downwardly directed fill tube **30** extending within a lower enclosed water holding reservoir **32**.

A grommet **34** is fixedly secured at an interior and intermediate shelf location of the body such that the upwardly extending actuator button **26** is positioned atop the intermediate portion. In use, and upon downwardly actuating the button **26**, a resultant spray mist pattern **36** is created at an upwardly angled direction and relative to a forwardly generated air path, see arrow **38**, in order to create the desired evaporative cooling effect.

A pair of batteries (e.g. AA sized alkaline) **40** and **42** are supported within mating recess configured nesting area, see at **41** and **43** in FIG. **1**, located within the intermediate portion **14** of the body and hence positioned at a location removed from the fan motor. Although not shown in three dimensions, it is understood that a suitable cover element is provided for sealing the batteries within the nesting areas provided in the body. Although not shown for purposes of clarity and ease of illustration, electrical connections are provided from a terminal location of the batteries **40** and **42**, and in order to provide power to the electrically operated fan motor **20**. An on/off switch is positioned in electrical contact with the batteries, at a suitable location along the body.

As will be appreciated from a view of FIG. **1**, the relocation of the battery nesting areas **41** and **43** respectively (battery compartments) into the reservoir area **32** leaves the opening around the blades **18** relatively unobstructed. Hence, upon actuation of the blades **18**, the air flow created by the blades **18** is improved since there is no bulky structure to impede the air flow.

Reviewing FIGS. **1** and **2** collectively, the narrow intermediate location **14** serves as the handle for the assembly. Further noted is the provision of a fill cap **44** along a front face of the fluid reservoir holding bottom **32** and which, upon rotating the body to a horizontal position, allows for refilling of the reservoir **32**.

A gasket seal (not shown) is provided for establishing a watertight seal upon the rotatable tightening of the cap **44** and, upon removal of the same, creates a suitably sized opening (such as 40 mm or greater) to allow for refilling ice cubes or the like within the fluid holding reservoir **32**. The end user can further grasp the fill port on the finger hold to remove the cap (by one of several means: unscrewing, pulling off an interference fit, partial turn and pull as with a bayonet mount). Also, the user can fill the water from a tap or add ice through the port.

As is also known, the user can install the batteries **40** and **42** into the enclosure **41** and **43** respectively, the batteries again being noted as kept aligned by the recess features on the reservoir and alignment features on the battery cover. As shown in FIG. **2**, a battery cover **48** is provided which overlies the nesting areas or battery compartments **41** and **43**. The battery cover **48** is configured to follow the contour of the intermediate neck or handle portion **14**. Further, the piston pump **28** is partially immersed in a top fill location, see at **46** in FIG. **2**, of the reservoir and is also held in place by the grommet **34** which also seals between the opening in the reservoir **32** and the outside (above-side) of the pump body.

It will also be observed that the reservoir **32** exhibits a thin wall construction and follows closely the inner surface of the enclosure forming the handle portion and the batteries (these forming a battery nest). It is understood that the reservoir **32** can exhibit a thinner wall than in prior art designs wherein the reservoir is located external to the motor (or any) enclosure. This has the advantage of reducing the likelihood of breaking and leaking.

As is also shown, the fan blades **18** are protected by a shroud **12** and which, in the illustrations provided, forms an extension of the enclosure. In the preferred design, the shroud **12** should come close to the surface defined by the revolution of the leading and trailing edges of the fan blades **18**, however not touching it. It is also envisioned that the shroud **12** should extend as far forward (see again side view of FIG. **2**) as the furthest downstream portion of the impeller, and should further extend rearward (at least) as the further upstream portion of the impeller.

As again shown in FIG. **2**, the upwardly angled stream of mist generated by the nozzle **26** is located in the periphery surrounding the impeller blades **18**. Also, again noted is the nesting of the batteries **40** and **42** in the battery compartments **41** and **43** located within the reservoir **32**. Further shown is an idealized representation of the air flow coming off the impeller blades, again at **38**, and which is highly collimated with a minimum of radial velocity. It is conceived that this variant would be assembled from front and rear halves to make one enclosure for the batteries, reservoir, motor and pump.

Referring now to FIGS. **3** and **4**, shown at **48** is a second variant of handheld water misting fan according to the present invention. A number of the features illustrated in the embodiment of FIGS. **3** and **4** are substantially identical to that shown in the first disclosed embodiment of FIGS. **1** and **2** and, accordingly, include identical reference numerals and are not repetitively described.

In FIGS. **3** and **4**, an actuator button **50** is not attached to an associated nozzle body and pump discharge tube. Instead, an inwardly directed portion of the button **50** is exhibited by upper **52** and lower **54** cam surfaces, which are inwardly displaced by the inward (such as spring depressing) of the interconnected button **50** (see solid and phantom illustrations respectively in FIG. **3**). The shaping of the motor supports is further modified, as shown at **22'**, from that shown in FIGS. **1** and **2**.

When actuated inwardly by the button **50**, the guiding cam surface **52** co-acts against an idler **62** located in a central, forward facing and intermediate location of the body whereas a lower cam surface **54** co-acts against nozzle idler (button) **50**. This operates the pump idler **56** which, when downwardly depressed, discharges a mist spray **58** (see FIG. **4**) from an associated nozzle **59** into the air stream **36** (in this instance, located upstream of the blades **18** and discharged in a forward direction). The direction of the mist spray in this variant is substantially forward however, it can be angled or otherwise oriented relative to the rotating impeller blades **18**.

Other considerations include idler supporting elements (see at **60** and again at **62**) affixed within the body to ensure straight line motion upon the idler by co-acting upon the upper cam surfaces (see at **63** in FIG. **3**) on the respective actuator buttons (**66** and **68** as also shown in FIG. **5**) being downwardly actuated. In this manner, the pump actuator button wedges itself (with the cam surfaces **52** and **54** on the top and bottom, respectively of the actuator) between the idlers on the nozzle body and the idlers on the enclosure to facilitate smooth mechanical motion and to prevent wedging or sticking of the assembly in use. Also noted is oblong shaped guide track **63** in FIG. **3** and which facilitates up/down movement of the nozzle idler **50** in a straight line.

FIG. **4** again shows this second variant from the side. Note is made of the nozzle **59** directing the mist from behind the impeller blades. The nozzle body further should be narrowed to minimize obstructing the air flow into the impeller **18**. Otherwise the details are similar to that shown in the primary embodiments of FIGS. **1** and **2**.

FIG. **5** illustrates at **64** a subvariant of the design of FIGS. **3** and **4**, in which a pair of actuator buttons **66** and **68** are provided secured to opposite intermediate sides of the body, and which can independently operate the nozzle **59** and pump (see idler **56**) from opposite sides of the enclosure. Each of the actuator buttons **66** and **68** again includes an inwardly directing portion, see at **70** and **72** respectively, each having an inwardly angled cam surface **71** and **73**, these guided by the nozzle idler **56** via mounted supports, again at **60** and **62**, as well as further at **74** and **76**, working against the idlers on the enclosure and nozzle body and in order to direct the downwardly spray issuing action of the idler **56** guided thereby.

It is further understood that the geometry of the idlers is such that they would have to be suitably wide to allow the left and right (or front and back) actuator buttons to bypass each other. As such, this makes the device suitable for both right and left handed persons. It is further noted that the actuators could be left/right oriented or front/back oriented, according to the desires of the designer.

Referring finally to FIG. **6**, illustrated at **78** is a yet further variant of the handheld water misting fan, and in which a modified actuator button **80** does not slide, but rather pivots about an axis **82** as distant as feasible within the enclosures (see as centrally located within the lower reservoir holding compartment) from the idler **56** on the nozzle body. A uniquely configured cam surface **84** is defined in inwardly extending fashion from the actuator button **80**, and such that the nozzle body idler **56** is caused during co-acting contact to move in an arc, rather than straight line. This construction eliminates the need for an idler positioned on the enclosure to guide the button, assuming further that the actuator button is made suitably larger and longer to permit near-straight-line motion.

Additional considerations include an associated on/off switch (again not shown) constructed of any conventional type like alternate action pushbutton, slide or toggle, further such that anyone skilled in the art could select and locate in a satisfactory location the correct switch. Other considerations also include a variety of ways to provide for a fill cap, a suitable one of which capable of being selected based on requirements by someone skilled in the art.

It is also understood that the term "idler" is interpreted to include by definition a wheel and axle type mechanism, or simply a smooth rounded surface that minimizes the amount of friction between the cams and the idler. The idlers can also preferentially be configured upon the surface or dispersed at some location within the base material and may further exhibit any of a number of lubricating elements such as wax, silicone, Teflon or molybdenum disulphide.

FIGS. **7** and **8** of the drawings illustrate still a further variation of an embodiment of the present invention. Again, the misting fan **10** includes a shroud portion **12** surrounding the blades **18**, the blades **18** operated by a motor **20**. The lower portion **16** provides a chamber which forms the reservoir **32** shown to include a lower extending neck portion **88** which forms the fill port for the reservoir **32**. The neck portion is adapted to receive a fill cap **90** in fluid sealing engagement in a manner well known in the art. It will be appreciated that the neck portion **88** provides the fill port for the fluid reservoir may be an enlarged fill port to accommodate the insertion of both water and ice. The pump assembly **92** as provided, includes a nozzle **93** at its upper end, and receives fluid from the reservoir **32** via the dip tube **94**.

In this embodiment, a pair of compartments **95** and **96** respectively are provided in the lower section of the shroud portion **12**. Appropriate electrical connections are provided to the motor **20** through the interior of the shroud portion **12**, and

through the motor supporting struts, **96** and **97** respectively. It will be appreciated in this embodiment that the battery compartments **95** and **96** are located in the lower portion of the shroud **12**, and therefore beneath the blades **18**. It is therefore clearly understood that the air stream **97** created by the blades **18** is unimpeded since there is no bulky structure formed either forwardly or rearwardly of the blades **18**. FIG. **8** clearly shows that the area within the shroud **12**, is unimpeded, and therefore the air flow created by the blades **18** is enhanced and improved. Further illustrated in FIGS. **7** and **8**, is the actuator button **26** which will operate the pump piston **87** by means of a back plate **97** having a cam surface **98**, all in the manner as previously described. In viewing FIG. **8**, it will be appreciated that the actuator button **26**, the back plate **97**, nozzle **93** and pump assembly **92** may be located between the battery compartments **95** and **96** respectively. In this manner, the actuator button **26** is centrally located to the fan device unit **10**, and permits operation by both right-handed and left-handed operators.

FIGS. **7** and **8** further illustrate the fact that by having a dog-bone shape configuration for the fan device **10** from top to bottom, the grippability of the device **10** is improved such that smaller hands may have the ability to grasp the device, and which permits both left-handed and right-handed operation. It further illustrates that the dog-boned shape configuration permits the lower portion of the fluid reservoir to be enlarged thereby improving the fluid reservoir capacity while still providing a relatively stream-lined device. The neck portion **88** which extends out through an opening **89** in the lower portion **16** allows the operator to insert the both water, and ice into the fluid reservoir **32**.

It will be appreciated from the above description that the ability to improve the air flow as generated by the fan blades, and to maximize reservoir capacity, as well as improving grippability is achieved by the redesigning and reconfiguration of the various parts and elements of the fan device in the present invention. Hence, the relocation of the battery compartments away from the motor housing which operates the fan to a remote location, is either in the base of the shroud as illustrated in FIGS. **7** and **8**, or formed in the wall of the reservoir **32**. Hence, the area around the fan blades remain unimpeded and provides a clear path for air flow through the shroud. The dog-bone shape configuration permits the reservoir to be enlarged at the lower end of the device, while minimizing the space located in the intermediate portion of the device. The narrower intermediate portion permits easy grippability by the operator while enlarged lower portion permits the reservoir to achieve greater capacity.

While there has been disclosed what is at present to be considered the preferred embodiments of the invention, various modifications may be made therein without departing from the true spirit and scope of the invention as set forth in the appended claims.

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10	misting fan
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12	shroud portion
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14	neck portion
15	
16	lower portion
17	
18	blades
19	
20	motor
21	
22	motor struts
23	
24	drive shaft
25	
26	actuator button
27	interior shelf
28	pump
29	
30	fill tube
31	
32	reservoir
33	
34	grommet
35	
36	spray mist pattern
37	
38	air path pattern
39	
40	battery
41	nesting area
42	battery
43	nesting area
44	fill cap
45	
46	piston pump location
47	
48	battery cover
49	
50	actuator button
51	
52	upper cam surface
53	
54	lower cam surface
55	
56	pump idler
57	
58	mist spray
59	nozzle
60	idler supporting element
61	
62	idler
63	upper cam surface
64	
65	
66	actuator button
67	
68	actuator button
69	
70	inwardly directed portion
71	cam surface
72	inwardly directed portion
73	cam surface
74	idler support
75	
76	idler suppport
77	
78	
79	
80	actuator button
81	
82	axis of 80
83	
84	cam surface
85	
86	actuator button
87	pump piston
88	neck portion
89	opening in bottom
90	fill cap

-continued

91	
92	pump assembly
93	nozzle
94	dip tube
95	battery compartment
96	battery compartment
97	back plate
98	cam surface
99	
100	
101	
102	
103	
104	
105	
106	
107	
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109	
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The invention claimed is:

1. A portable misting and cooling fan device of the type formed by a body including a lower handle section and an upper head section, the lower handle section accommodating a fluid reservoir and the upper head section including a fan device operated by a fan motor and surrounded by a protective shroud having an upper end and a lower end, and fan actuator means and a misting nozzle, the misting nozzle being in fluid communication with the reservoir through pump means for pumping fluid from the reservoir to the misting nozzle, the pump means having actuator means for actuating the pump means, and the misting nozzle being positioned in the head section to deliver a stream of misted fluid into the air stream created by the fan device, the improvement comprising,

a power source compartment for accommodating a power source therein,

said power source compartment being positioned within the device in a location remote from the fan motor,

the area bounded by the shroud being substantially free of any structure thereby to maximize the air flow path therethrough,

and the lower handle section having a relatively narrow intermediate portion forming a gripping handle, and an enlarged lower portion to form an enlarged fluid reservoir.

2. The portable cooling and misting fan device as set forth in claim 1 above, wherein said power source compartment is formed as a portion of the fluid reservoir and is fluid sealing relationship relative to said fluid reservoir,

and said handle section having an access panel formed therein, said access panel formed to overlie said power source compartment thereby to provide access to said power source compartment,

and said access panel being configured and contoured in order to conform to the configuration of said handle section.

3. The portable cooling and misting fan device of the type set forth in claim 1 above, wherein said power source compartment is formed within the lower section of the shroud and below the area bounded by the shroud, whereby said power source compartment is removed from the area bounded by the shroud and leaves the area bounded by the shroud to be substantially unobstructed.

4. The portable cooling and misting fan device as set forth in claim 3 above, wherein said shroud includes an access panel formed to overlie said power source compartment thereby to provide access to said power source compartment.

5. The portable cooling and misting fan device as set forth in claim 1 above, wherein the shroud is formed by a body having a hollow interior, and electrical communication is established as between said power source compartment and the fan motor by providing the appropriate electrical contacts in the hollow body of the shroud thereby to provide power to the fan motor.

6. The portable cooling and misting fan device as set forth in claim 1 above, wherein the handle section is provided with an opening formed at the bottom thereof, and the fluid reservoir includes a neck portion which extends through said opening thereby to provide a fill port,

said fill port being sufficiently large to permit the insertion of ice and fluid therethrough, and said fill port, accommodating a fill cap enclosed said fill port in fluid tight relationship.

7. The portable cooling and misting device as set forth in claim 1 above, wherein the actuator means comprises a pair of actuator buttons positioned on opposed sides of the upper head section, each one of said actuator buttons having an inwardly directed portion, said inwardly directed portion having an inwardly angled cam surface, and said nozzle includes nozzle idlers, said cam surface working against said nozzle idlers thereby to operate the pump assembly,

each one of said pair of actuator buttons being operable in a plane from one another, whereby the pump assembly may be operated from either side of the device.

8. The portable cooling and misting device as set forth in claim 1 above, wherein the actuator means comprises an actuator button, said actuator button having an inwardly directed portion having a cam surface, the nozzle having a nozzle idler, and said actuator button is positioned to pivot about an access distant from said nozzle idler, whereby depression of said actuator button causes said nozzle idler to move in an arch.

* * * * *

EXHIBIT B

US007810794B2

(12) **United States Patent**
Chen

(10) **Patent No.: US 7,810,794 B2**
(45) **Date of Patent: Oct. 12, 2010**

(54) **BREAK RESISTANT JOINT**

(76) Inventor: **Yung Chen**, 3 Larkspur La., Clarendon Hills, IL (US) 60514

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 867 days.

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B01F 3/04 (2006.01)

(52) **U.S. Cl.** **261/28**; 261/89; 239/289

(58) **Field of Classification Search** ..... 261/28, 261/89, 90, DIG. 3, DIG. 43; 239/289, 290
See application file for complete search history.

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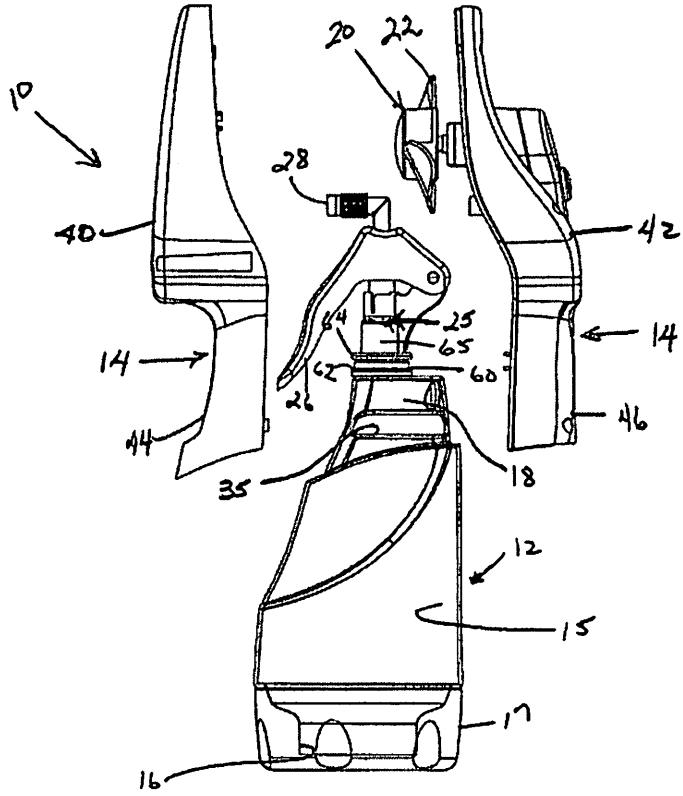
(57) **ABSTRACT**

There is disclosed a portable misting fan formed by upper and lower body portions which are joined together along a joint. The joint is improved by providing the lower body portion with a non-circular neck portion along its top end, and wherein the upper body portion includes two halves which terminate in lower body collar sections, intended to be joined together in overlying relationship relative to the neck portion. A rail and groove system is employed as between the upper first and second body portions, and the neck portion, so that the rails will slidingly engage the grooves in the neck portion rendering the joint resistant to rotation. The neck portion includes an aperture into which a sleeve is press fitted, the sleeve includes upper and lower lips, and the lower body collar sections include inwardly extending flanges which overlie and engage the upper and lower lips formed in the sleeve, thereby brace and secure the pump assembly within the device.

18 Claims, 8 Drawing Sheets



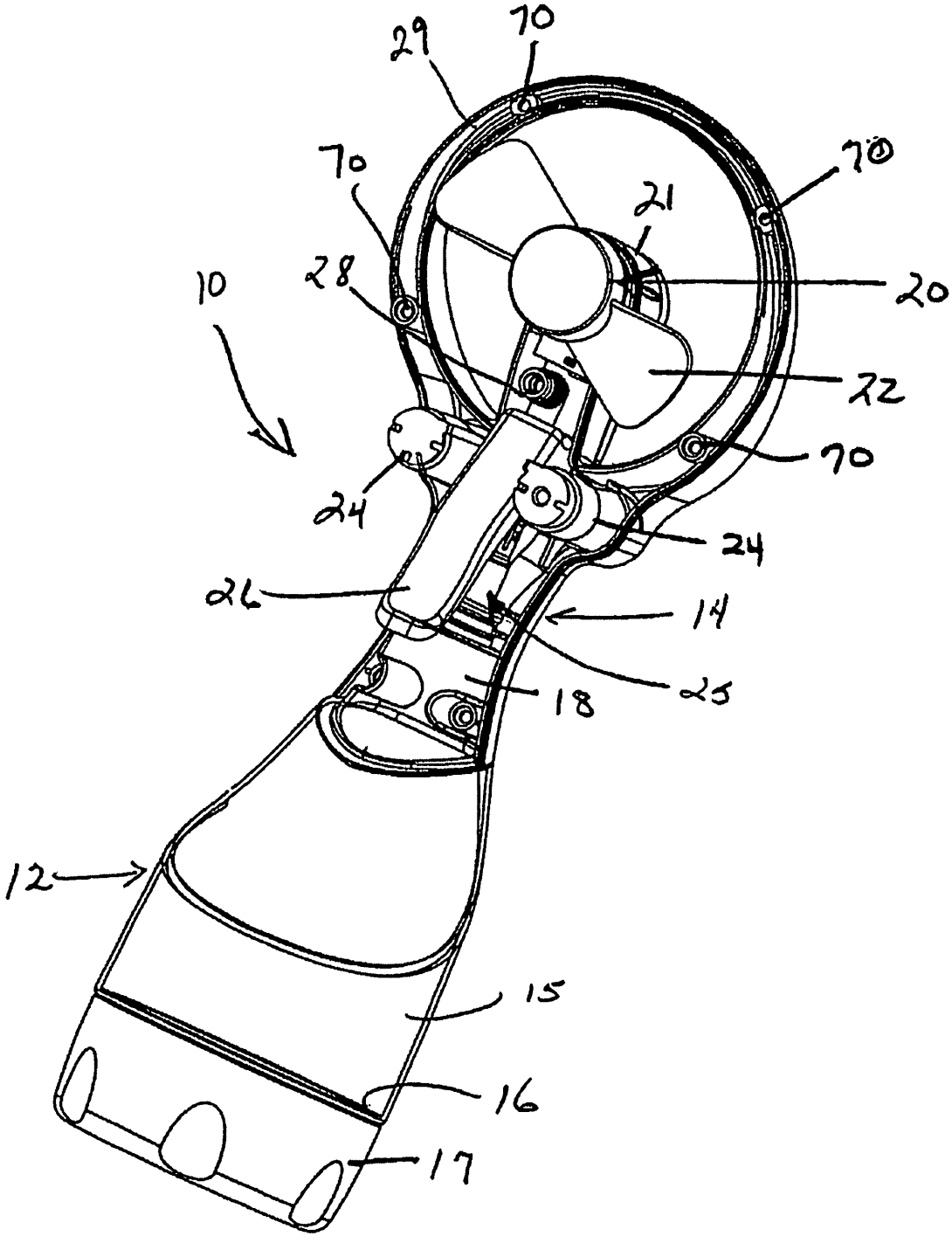


Fig 1

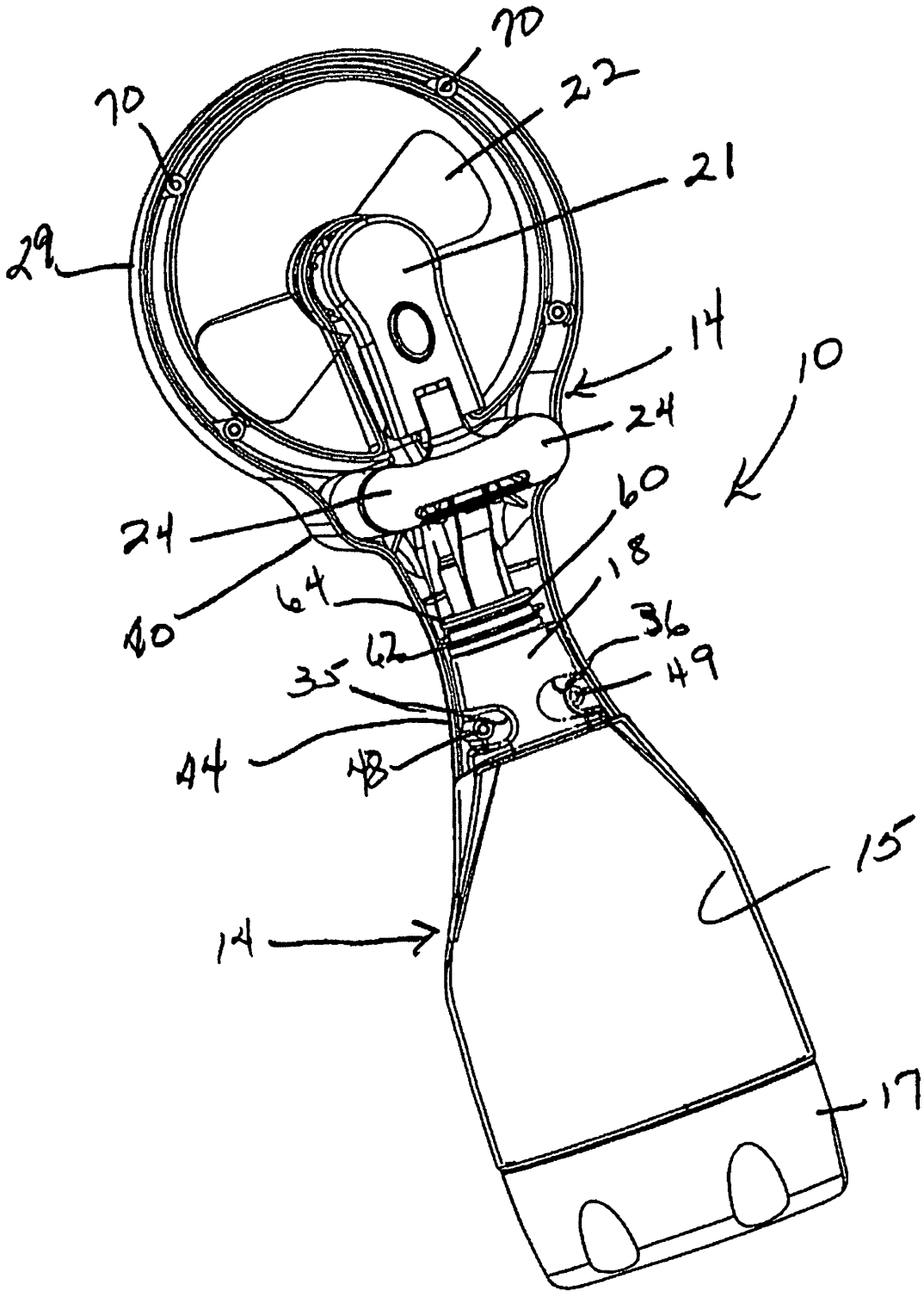


Fig 2

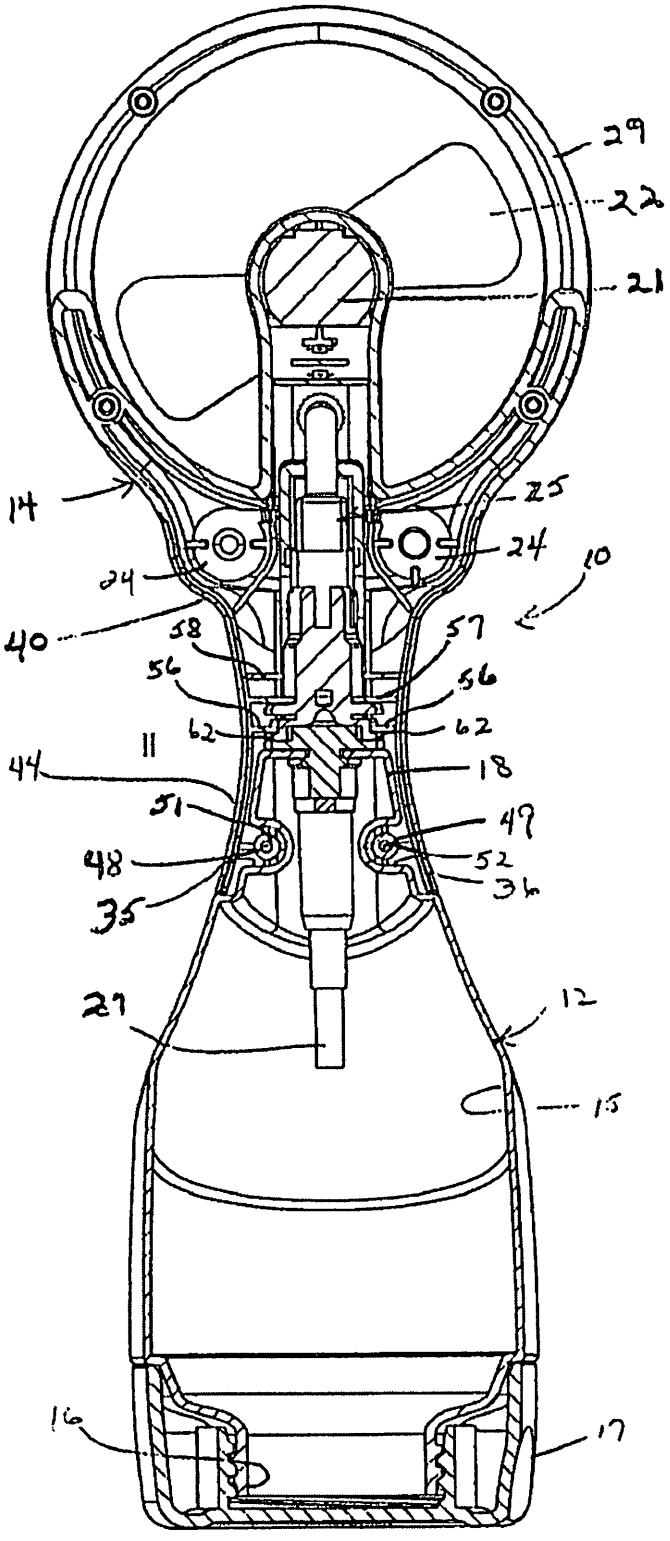

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FIG 3

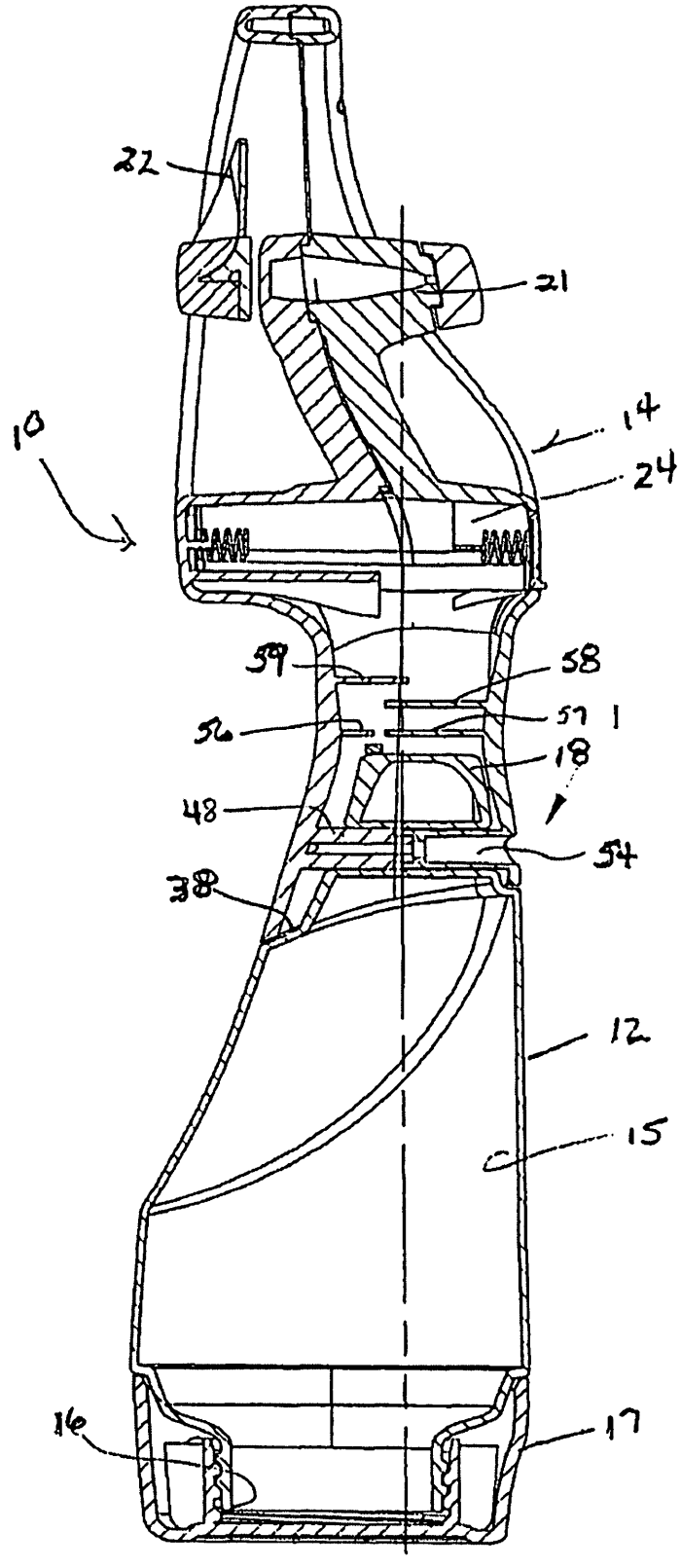

Fig. 4

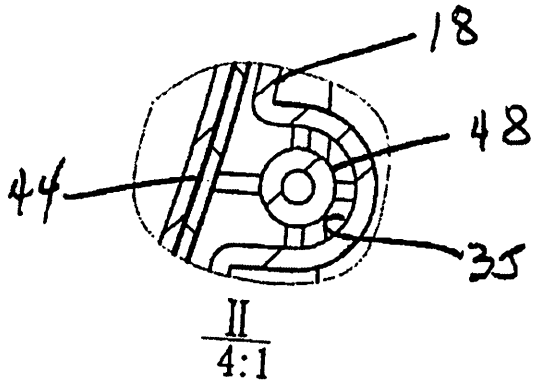

FIG 5

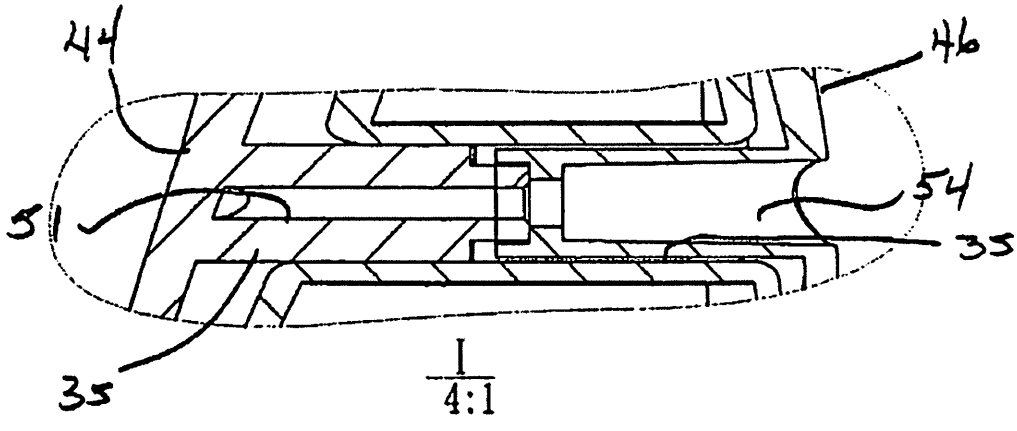

FIG 6

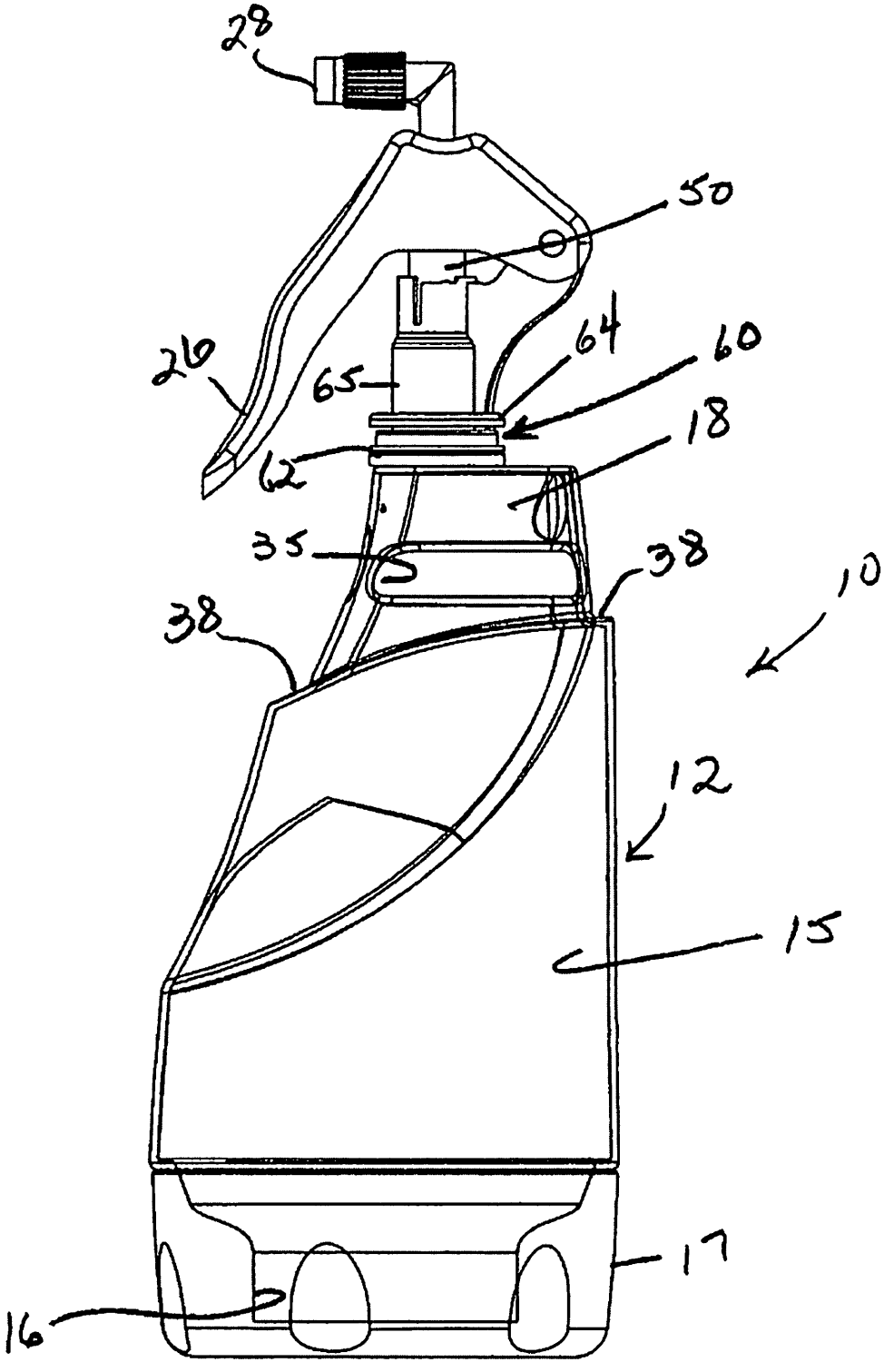

Fig 7

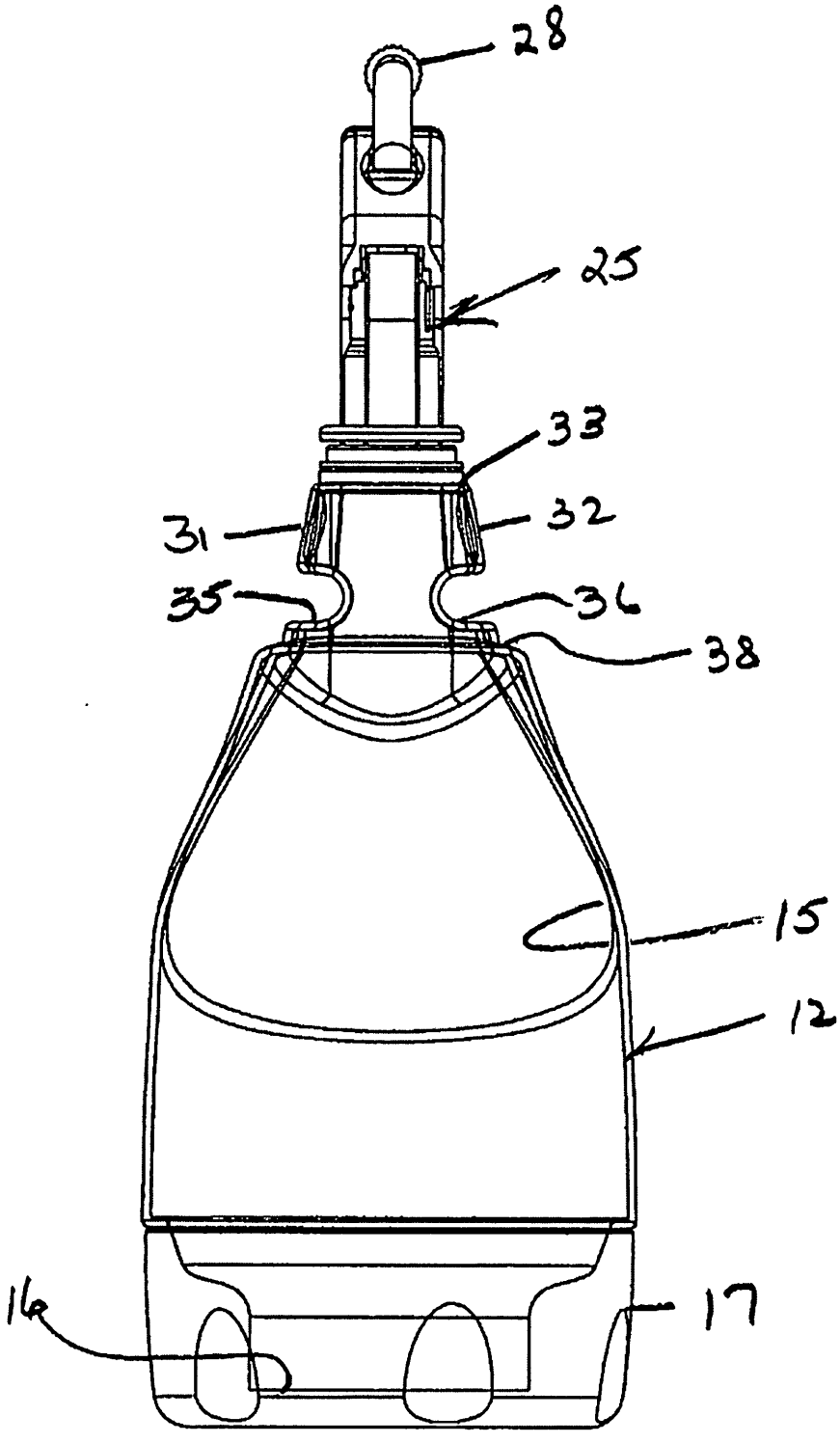

Fig 8

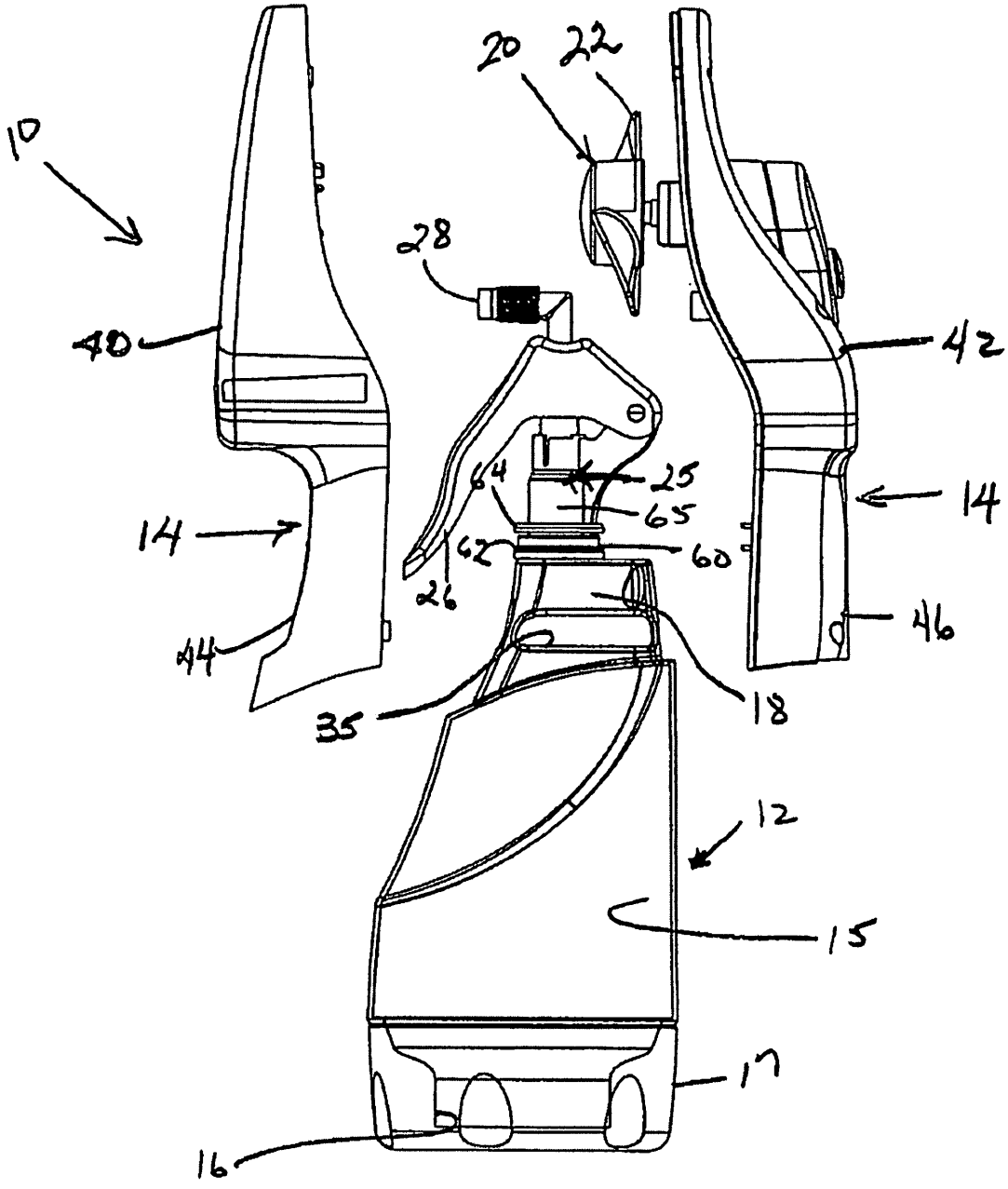

Fig 9

BREAK RESISTANT JOINT

I. FIELD OF THE INVENTION

The present invention relates to misting fan devices, generally of the type formed by an upper body portion which includes a motorized fan and a pump assembly having a misting nozzle associated therewith, and a lower body portion which basically accommodates a fluid reservoir, and a fill port for filling the fluid reservoir with a fluid. According to the present invention, a more secure and break resistant joint as between the upper and lower body portions is presented.

II. BACKGROUND OF THE INVENTION

Portable misting fans have become quite popular over the last several years. These devices generally tend to be formed by an upper body portion which includes a fan device which is motorized, and usually powered by one or more batteries contained in a battery compartment, and electrically connected to a motor which operates the fan. The upper body portion is further provided with a pump assembly which terminates in a misting nozzle, wherein the mist is directed into the air stream created by the fan. The lower body portion generally accommodates a fluid reservoir which is usually filled with water or a mixture of ice and water, and also includes a fill port to permit the user to easily fill the fluid reservoir with water. The upper and lower body portions are affixed together incident to the assembly thereof, and this is usually accomplished by having the lower body portion in the configuration of a bottle with a screw-threaded neck, and the upper body portion includes a cap which has threads, and screw-threads onto the bottle. In this manner, the upper and lower body portions of the fan device are inner-connected. In the original variation of the device, the method of filling the fluid reservoir was to unscrew the upper body portion from the lower body portion, and simply fill the bottle with fluid. The bottle would then be screwed back onto the upper body portion to form the entire fan device. The bottle was designed to have a diametric dimension rendering the same to be held by the hand of the user in relatively easy fashion. However, one of the drawbacks of that variation of a misting fan device was that the neck of the bottle was usually a typical bottle neck, and therefore not sized sufficiently large to allow the operator or user to insert ice cubes therein. Therefore, in order to have cooled fluid, it was necessary to obtain the water from a cooled source.

That objection has been overcome by providing a separate fill port in the lower body portion of the device, the fill port having a diametric dimension sufficiently large enough so that ice cubes may be inserted into the fluid reservoir. The fill port could either be located on the side wall of the device, in which case, the fill port would be covered by a fill cap which would be appropriately gasketed so that a fluid tight seal is achieved. Alternatively, the fill port can be on the very bottom of the device, such that fill cap which actually forms the bottom of the device and is positioned over the bottom opening of the device in fluid tight arrangement.

However, whatever construction is employed, generally, in order to manufacture a portable misting fan device, it is necessary to join together the upper body portion to the lower body portion through some means of engagement. As was indicated above, while this has generally been done with a threaded neck with a screw cap, it has been found that such an arrangement represents an inherent weakness in the device. It is well known that these devices are generally used in the out of doors, or in connection with sports activities. Hence, the

portable fan devices are prone to being dropped or otherwise handled in a rough manner and where the device incorporates a weakness, the device is prone to breakage. For example, the typical portable misting fan device of the type which is formed by means of a bottle having a neck with threads and accommodates the upper body portion thereon by screw-threading a cap thereon, the joint between the upper and lower body portions is rather weak and very prone to breakage when dropped. Once the device is dropped and breakage occurs, the device is no longer useful and must be discarded.

Another problem arises from the fact that current devices may also include a shroud which surrounds the impeller blades of the fan. The shroud functions to protect the fan blades from damage, and also protects the user from the movement of the fan blades. In order to create a device that has a shroud surrounding the impeller blades, the devices are generally made with two pieces, including front portion of the shroud, and a rear portion of the shroud, the front and rear then being joined together. It is therefore apparent that where the device includes a shroud, there is even a further joint which would be prone to breakage upon dropping the device.

Various attempts have been made in finding different methods for assembling the upper and lower body portions together so that the joint between the two portions is more break resistant and secure. It is apparent that the more break resistant the joint, the longer life the product has for the user thereof.

Prior U.S. Pat. No. 6,398,132 shows various means of creating a joint between the upper and lower body portions. Various of the embodiments disclosed in the aforementioned patent show the use of adhesives to secure the head unit or the upper body portion to the lower body portion or the chamber, as illustrated in FIG. 9A of the drawings. A further modification describes the use of ultrasonic welds which are used to secure the upper head unit or upper body portion to the bottle portion or fluid reservoir. The patent further illustrates a method of heat staking the joint which would bond the neck of the bottle to the collar of the upper body portion. Further modifications of devices illustrated in the aforementioned patent show the application of two half units which are used to surround the neck of the bottle, after which the same are adhesively bonded and screwed together. These variations particularly relate to a misting fan device which is formed of two half sections which are jointed together in order to complete the assembly.

The present invention seeks to provide an improved misting fan device which is assembled in a manner which renders the joint between the upper and lower body portions to be more break resistant and therefore more resistant to damage when dropped. It has been determined that by changing the configuration of the neck portion, and the configuration of the collar of the upper body portion which attaches to the neck portion, a more secure joint is achieved.

III. OBJECTS AND ADVANTAGES

It is therefore the principal object of the present invention to provide an improved portable misting fan device of the type generally formed by an upper body section and a lower body section which are joined together in order to form a complete device. The object of the invention is provide a more secure joint as between the two sections in order to render the device more break resistant.

In furtherance of the aforegoing object, an object of the present invention is to provide a portable misting fan device of the type generally described, wherein the lower body portion is formed in an upwardly contoured configuration which ter-

minates in an upper neck portion having a non-circular configuration with a relatively flat top wall. The neck portion is provided with at least one groove running along the side wall of the neck portion. The upper body portion is formed from a first half body portion and second half body portion, both of which terminate in a first and second collar bodies respectively. The first and second collar bodies are contoured and configured to overlie and capture the neck of the lower body portion therebetween. Each of the first and second collar bodies is provided with rails which are sized and positioned such that the rails engage within the groove of the neck portion when the first and second half body portions are assembled onto the neck. Hence, the combination of the non-circular configuration of the neck portion as well as the rail and groove structure prevents the upper body portion from rotating in any manner relative to the lower body portion, and secures the joint between the two parts in a more break resistant manner.

In conjunction with the foregoing object, a further object of the present invention is to provide an improved portable misting fan device of the type described, wherein each of the first and second collar bodies forming the upper body portion are provided with a pair of rails, and the neck portion of the lower body portion is provided with opposed grooves on either of the opposed side walls of the neck, such that when the first and second half body portions are assembled onto the neck portion, the respective rails will slidingly engage within the grooves of the neck portion, when assembled thereon. Lock means may then be employed for lockingly engaging the two half sections together once assembled on the neck of the lower body portion.

A further object of the present invention is to further improve upon the device, by providing a sleeve which is press fitted into an aperture formed in the top wall of the neck portion, the sleeve accommodating the pump assembly therethrough. The sleeve has a lower lip which is formed by a flange which extends outwardly from the sleeve for a short distance. Each of the first and second collar bodies is provided with a flange formed along the interior side wall thereof and extending outwardly a short distance, the flange being sized and positioned such that upon assembly of the first and second half portions onto the neck portion, the flanges will overlie the lower lip of the sleeve. In this manner, the flanges provide additional support for the pump assembly rendering that portion of the device more break resistant.

A further object of the present invention, in view of the foregoing object, is to provide a sleeve which has an upper lip, and a lower lip and each of the first and second collar bodies is provided with a pair of flanges which are sized and positioned such that upon assembly of the first and second half body portions together, the respective flanges will overlie and seat against the respective upper and lower lips of the sleeve when assembled thereon thereby to provide additional support for the pump assembly.

Further objects and advantages will best be understood by reference to the accompanying drawings taken in conjunction with the specification as set forth hereinafter.

IV. SUMMARY OF THE INVENTION

In summary, the present invention provides a portable water misting fan device which is formed by an upper body portion and a lower body portion which are joined together to form a complete fan device. The invention is directed to the construction of the joint between the upper and lower body portions and results in a joint which is more break resistant than prior art device. The joint is created by a re-engineering of the elements forming the joint.

The lower body portion forms the fluid reservoir and incorporates a fill port for filling the fluid reservoir in a known manner. The lower body portion terminates at its top end in a non circular neck portion which is surrounded at its lower end by a support ledge formed in the lower body portion. The neck portion, in the preferred embodiment, includes a pair of opposed grooves formed in opposed side walls of the neck portion. The top wall of the neck portion is provided with an aperture which accommodates a sleeve fitted therein. The sleeve provides a fitting for the pump assembly to establish fluid communication between the fluid reservoir and the fluid misting assembly in the upper body portion.

The upper body portion is formed by a front half body portion and a rear half body portion which are joined together around the neck portion of the lower body portion. The half body portions may alternately be right and left half body portions installed over the neck portion to form the upper body portion. The front and rear half body portions accommodate the fan assembly and the fluid misting pump assembly. Each of the front and rear half body portions terminate at the lower end thereof in a first or front collar body and a second or rear collar body. When assembled, the front and rear collar bodies rest on the support ledge of the lower body portion.

The front and rear collar bodies are each provided with rails formed along the interior walls thereof, and are positioned so as to engage with the grooves formed on the opposed side walls of the neck portion. The rails are centrally cored and are threaded, and the rear half body portion is provided with access openings to accommodate screws there through such that the front and rear body halves may be lockingly engaged together once installed on the neck portion. For some applications, sonic welding, heat staking or snap fit joints might be more appropriate and provide comparable durability.

Break resistance is further enhanced by providing enhanced security for the pump assembly. This is accomplished by providing a sleeve fitted within the neck aperture with a lower lip and an upper lip formed thereon. The front and rear half body portions are provided with a flange formed along the interior wall thereof which is positioned to overlie the lower lip when the front and rear half body portions are installed on the neck portion and locked together. Further, each of the front and rear half body portions is provided with an upper securement flange which is positioned to overlie the upper lip when the halves are in the installed position. Finally, one or both of the front and rear half body portions is provided with a bracing flange which is positioned to engage and brace against the sleeve when the front and rear half body portions are in the installed position. Hence, when the front and rear half body portions are installed on the neck portion, the respective flanges will overlie the respective lips to brace the pump assembly and resist damage to same.

V. BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is a front perspective view of the misting fan device showing the upper body portion having the rear half body portion in place and first half body portion removed;

FIG. **2** is a rear perspective view, showing the front half body portion in place and the rear half body portion removed and the positioning of the rails and the grooves of the neck portion and the access openings positioned therein;

FIG. **3** is a rear elevational view in cross section showing the configuration of the neck portion and the rail and groove

system, and further showing the respective lips and flanges as between the sleeve and rear body half portion to form the break resistant joint;

FIG. 4 is a side elevational view in cross section, showing the front and rear half body portions installed on the neck portion and the rail and groove system of the respective parts and the positioning of the flange, securement flange and bracing flange formed on the front and rear half body portions;

FIG. 5 is a detailed view in cross section taken from FIG. 3 showing the rail and groove system as between the neck portion and the front half body portion;

FIG. 6 is a detailed view in cross section taken from FIG. 4 showing the groove and rail system as between the neck portion and the front and rear half body portions and the access openings in the rear half body portion;

FIG. 7 is a side elevational view of the lower body portion showing the neck portion with support ledge surrounding the neck;

FIG. 8 is a rear elevational view of the lower body portion showing the neck portion thereof and the grooves formed in the opposed side walls thereof; and

FIG. 9 is a side elevational view showing the lower body portion of the fan device and the front and rear half body portions in blown apart relation prior to installation on the neck portion.

VI. DETAILED DESCRIPTION OF DRAWINGS

As shown in FIG. 1, the fan device 10 is generally formed by a lower body portion 12, and an upper body portion 14. The lower body portion 12 forms the fluid reservoir 15 which, in this embodiment, is provided with an enlarged fill port 16, which is enclosed by means of a cap 17. It will be appreciated in the embodiment as disclosed, that enlarged fill port 16 permits the operator to fill the fluid reservoir 15 with water, and to further permit the insertion of ice cubes through the enlarged fill port 16. The cap 17 is appropriately gasketed, as is well known in the art, so that a fluid tight seal is created as between the cap 17 and fill port 16. The upper part of the lower body section 12 terminates in a neck portion 18 which will be described in greater detail hereinafter.

The upper body portion 14 supports the fan assembly 20 which is driven by a motor contained within motor enclosure 21 which in turn drives the impeller blades 22. The upper body portion 14 includes battery compartments 24 which accommodate appropriate batteries for operating the motor in order to activate the fan assembly 20. The upper body portion 14 further includes a pump assembly 25 which, as is well known in the art, includes a piston rod (not shown), driven by a piston trigger 26 which operates to bring fluid to a fluid misting nozzle 28. In the embodiment as illustrated, the upper body portion 14 includes a shroud 29 which encircles the impeller blades 22 and operates to protect the impeller blades 22 from damage, and also to protect the operator from the rotational movement of the impeller blades 22 when activated.

As will be appreciated from a view of FIG. 9 of the drawings, the entire fan device 10 is created by installing the upper body portion 14 onto the lower body portion 12. As has been indicated in the past, typically the joint formed between the two parts is created by means of a threaded neck which is formed on the lower body portion 12, while the upper body portion 14 is usually provided with a threaded cap which screw threadedly mounts onto the neck of the lower body portion 12. The present invention seeks to present an improved joint between the two sections in order to resist breakage thereby increasing the life of the product. The following description is related to the improved joint as between the upper body portion 14 and lower body portion 12.

With reference to FIGS. 2 through 9 of the drawings, as previously indicated, the upper part of the lower body portion 12 terminates in a neck portion 18. The neck portion 18 has a non-circular configuration, and is formed by opposed side walls 31 and 32 respectively, and a substantially flat top wall 33. As illustrated in FIG. 8, the opposed side walls 31 and 32 of the neck portion 18 are provided with opposed grooves 35 and 36 respectively. The grooves 35 and 36 are substantially parallel to one another, and generally run between the front and rear of the device 10. The lower body portion 12 further is provided with a support ledge 38 which surrounds the neck portion 18. The support ledge 38 surrounds the neck portion 18 and provides a surface for supporting the upper body portion 14 as will be more fully described hereinafter.

As particularly shown in FIG. 9, the upper body portion 14 is generally formed by a front half body portion 40, and a rear half body portion 42. It will therefore be appreciated that the shroud 29 is actually formed by a front half body portion 40 and rear half body 42, which when installed on the neck portion 18, forms the total upper body portion 14. If desired, the shroud 29 could be formed by left and right half body portions however, for ease of further description, a front and rear half body portions will be described. Each of the front half body portion 40 and rear half body portion 42 terminates at their lower end in a first or front collar body 44 and a rear or second collar body 46. Each of the front and rear half body portions 40 and 42 respectively is provided with a rail 48 and 49 respectively (See FIG. 3). As seen in FIG. 3, the rails 48 and 49 are designed to engage within the respective grooves 35 and 36 when the front and rear half body portions 40 and 42 are installed onto the neck portion 18. Each of the rails 48 and 49 includes a central core 51 and 52 respectively which are provided with appropriate threads therein. In the present embodiment, the rear half body portion 42 is provided with access openings 54 which provides an access port to install appropriate screws for screw-threading the respective rails 48 and 49 together when the front and rear half body portions 40 and 42 are installed onto the neck portion 18. As previously mentioned, other means may be employed to join the parts together including heat staking, sonic welding, snap fit, and pin in socket.

Further, and as shown in FIGS. 3 and 4 of the drawings, the front and half body portions 40 and 42 respectively are each provided with flanges 56 and 57, and with a further securement flange 58, and a bracing flange 59.

As shown in FIGS. 7-9 of the drawings, a sleeve 60 is provided which fits within a neck aperture (not shown) formed in the top wall of the neck portion 18. The sleeve 60 is tubular in configuration, and provides access for the pump assembly 25 in order to accommodate fluid communication as between the fluid misting nozzle 28, and the fluid reservoir 15. It will be appreciated that the various components of the pump assembly 25 will fit within the sleeve 60, and will be manipulated by means of the pump trigger 26. The pump assembly 25 operates in a manner well known in the art, such as by actuating the piston trigger 26 repeatedly in order to pump fluid up from the fluid reservoir 15 via the dip tube 27 (FIG. 3), again as is well known in the art.

The sleeve 60 is shown to include a lower lip 62 and an upper lip 64 spaced upwardly from the lower lip 62. The upper part of the sleeve 60 includes a top section 65 which again is tubular in configuration and allows the pump piston 50 to traverse therethrough. As shown in FIGS. 3 and 4 of the drawings, the flanges 56 and 57 will overlie and rest against the lower lip 62 when the upper body front and rear body half

portions 40 and 42 are installed on the neck portion 18. Further, the securement flange 58 will rest against the upper lip 64, and the bracing flange 59 will brace against the top section 65 of the sleeve 60. In actual construction, the flanges 56, 57 and 58 are semi-circular in configuration in view of the fact that the first and second collar bodies 44 and 46 are substantially semi-circular in configuration. It will also be appreciated that the lower lip 62 and upper lip 64 are basically circular in configuration since the sleeve 60 has a tubular configuration which is substantially circular. It will therefore be appreciated that when the front half body portion and rear half body portion 40 and 42 respectively come together in their assembled configuration, they will effectively overlie the lower lip and upper lip 62 and 64 respectively. It will also be appreciated that when the screws are inserted through the access openings 54 in order to screw the central cores 51 and 52 together incident to the installation operation, the bracing flange 59 will come to rest and brace against the top section 65 of the sleeve 60.

The fact that the neck portion 18 has a non-circular configuration and basically is formed with opposed side walls which are substantially parallel, and flat top wall, will create a more break resistant joint. As shown in FIGS. 5 and 6, once the rails of the first and second collar bodies 44 and 46 are inserted into the grooves 35 and 36 of the neck portion 18, the assembly will result in a joint which resists the ability to rotate the upper body portion 14 relative to the lower body portion 12. The respective flanges 56, 57 and 58 formed on the interior wall of the front and half body portions 40 and 42 will provide bracing for the pump assembly and hence increase the break resistance of the pump assembly.

It will also be appreciated that in order to further secure the two front and half body portions 40 and 42 together, incident into the assembly thereof, a series of securement apertures 70 may be provided in each of the front and rear half body portions 40 and 42 which allow screws to be inserted therethrough in order to screw-thread the parts together and lock the same together.

It will be appreciated that the construction of the upper body portion 14 and lower body portion 12 when assembled together, will resist rotation because of the configuration of the neck portion 18 being non-circular, and further providing the groove and rail system as between the neck portion 18, and the front and rear half body portions 40 and 42. Breakage of the pump assembly is further resisted by providing a series of the flanges 56, 57 and 58 which overlie and encircle the upper and lower lips 64 and 62 respectively formed in the sleeve 60. The bracing flange further aids in resistance to breakage of the pump assembly should the fan device 10 be dropped or fall, thereby rendering the device less likely to be damaged upon impact.

It is further observed that the assembly of the various parts to form the portable misting fan device 10 of the present invention eliminates the need to use adhesives, sonic welding, or other such more expensive techniques for assembling the parts and locking the same in position to form the completed fan device 10. Hence, the present invention provides a economically efficient break resistant joint which can be employed for assembling any device together which is formed of upper and lower portions where it is intended to reduce the risk of breaking the device upon falling or upon impact on a hard surface. The present construction, formed by the various parts and elements as described, is particularly adaptable to portable misting fan devices which are generally used in connection with a variety of activities, especially sports activities, where the risk of the device falling or impacting a hard surface is enhanced.

While there has been described what is a present considered to be the preferred embodiment of the invention, it will be understood that various modifications and variations may be made therein without departing from the true spirit and scope of the invention as embodied in the accompanying claims.

The invention claimed is:

1. A misting fan device of the type formed by an upper body portion accommodating a motorized fan assembly and a spray misting assembly, and a lower body portion accommodating a fluid reservoir and a fill port for the fluid reservoir, the improvement comprising in combination,

the lower body portion having an upwardly contoured configuration terminating in an upper neck portion having a non-circular configuration and a relatively flat top wall,

an aperture formed in said top wall of said neck portion, said aperture providing an access port for the spray misting assembly to establish fluid communication as between the fluid reservoir and the spray misting assembly,

said upper body portion formed by a first half body portion and a second half body portion,

each of said first and second half body portions terminating in a first collar body and a second collar body respectively,

one of said neck portion and said first collar body and said second collar bodies having a least one elongate groove formed therein, and the other of said neck portion and first and second collar bodies having at least one rail formed therein,

said first and second collar bodies being formed and contoured to overlie and capture said neck portion therebetween and said rail being slidedly engaged within said groove when said first and second half body portions are assembled onto said neck portion to form said upper body portion,

and lock means for locking said first and second body portions together when assembled on said neck portion thereby to form a break resistant joint as between said lower body portion and said upper body portion when said misting fan device is assembled.

2. The misting fan device as set forth in claim 1 above, wherein said neck portion assumes a substantially square configuration bounded by opposed side walls and a relatively flat top wall, and said first and second half body portions are provided with first and second collar bodies respectively which are contoured and configured to overlie and capture said neck portion therebetween when said first half and second half body portions are assembled onto said neck portion.

3. The misting fan device as set forth in claim 1 above, wherein said first half body portion comprises a front half body portion and said second half body portion comprises a rear half body portion.

4. The misting fan device as set forth in claim 2 above, wherein said elongate groove is formed in at least one of said side walls of said neck portion and at least one of said first and second collar bodies has a rail formed therein, said rail being sized and configured to engage within said groove when said first and second half body portions are assembled on said neck portion.

5. The misting fan device as set forth in claim 4 above, wherein said neck portion is provided with a groove formed in each of the opposed side walls thereof, and each of said first and second collar bodies is provided with a pair of opposed rails formed therein, said rails being sized and configured to engage within the corresponding grooves of said neck portion

when said first half and second half body portions are assembled on said neck portion.

6. The misting fan device as set forth in claim 1 above, wherein said aperture in said neck portion is adapted to accept a sleeve fitted therein, said sleeve having a lower end press fitted within said aperture and an upper end extending upwardly from said aperture, said upper end having at least one lower lip formed thereon and extending laterally outwardly for a distance, and at least one of said first and second collar bodies having a flange formed thereon and extending inwardly therefrom, said flange being sized and positioned such that said flange will overlie said lower lip when said first and second half body portions are assembled on said neck portion thereby to further secure the joint between the upper and lower body portions when assembled together.

7. The misting fan device as set forth in claim 6 above, wherein each of said first and second collar bodies has a flange formed thereon and extending inwardly therefrom each of said flanges being sized and positioned to overlie said lower lip when said first and second half body portions are assembled on said neck portion.

8. The misting fan device as set forth in claim 6 above, wherein said sleeve further includes an upper lip formed on said sleeve, said upper lip being spaced from said lower lip a short distance, and at least one of said first and second collar bodies has a securement flange formed thereon and extending inwardly a distance, said securement flange being spaced and positioned to overlie said upper lip when said first and second half body portions are assembled on said neck portion.

9. The misting fan device as set forth in claim 8 above, wherein each of said first and second collar bodies is provided with a securement flange formed thereon and extending inwardly a distance, said securement flanges each being spaced and positioned to overlie said upper lip when said first and second half body portions are assembled on said neck portion.

10. The misting fan device as set forth in claim 1 above, wherein one of said first and second collar bodies includes a stabilizing flange formed thereon and extending inwardly a distance, said stabilizing flange being spaced and positioned to matingly engage said sleeve when said first and second half body portions are assembled on said neck portion.

11. The misting fan device as set forth in claim 1 above, wherein said lower body portion is configured to have a support ledge formed immediately below and surrounding said neck portion, said support ledge forming a support surface for supporting said first and second collar bodies thereon when said first and second half body portions are assembled on said neck portion.

12. The misting fan device as set forth in claim 5 above, wherein each of said pair of opposed rails are centrally cored and provided with internal threads, and one of said first and second collar bodies is provided with access openings, said access openings being in horizontal alignment with said central cores, and said lock means comprises screws which may be inserted through said access openings and screw-threaded into said central cores to lockingly engage said first and second half body portions together when assembled on said neck portion.

13. A misting fan device of the type formed by an upper body portion accommodating a motorized fan assembly and a spray misting assembly, and a lower body portion accommodating a fluid reservoir and a fill port for the fluid reservoir, the improvement comprising in combination,

the lower body portion having an upwardly contoured configuration terminating in an upper neck portion bounded by a relatively flat top wall and opposed side walls which are substantially parallel in configuration,

said upper neck portion having an aperture formed in said top and said neck portion further provided with a pair of opposed parallel elongate grooves formed therein and extending along said opposed side walls,

said aperture providing an access port for said spray misting assembly to establish fluid communication as between said fluid reservoir and said spray misting assembly,

said upper body portion formed by a first front half body and a second rear half body,

each of said first and second front and rear half bodies respectively terminating in a front collar body and rear collar body respectively,

each of said front and rear collar bodies provided with a pair of opposed rails formed integrally therein,

said front and rear collar bodies being formed and contoured to overlie and capture said neck portion therebetween and said rails being slidelingly engaged within said respective parallel grooves in said neck portion when said first front half and second rear half body portions are assembled onto said neck portion to form said upper body portion,

and lock means for locking said first front half body to said second rear half body portion together, thereby to form a break resistant joint as between said upper body portion and said lower body portion when said misting fan device is assembled.

14. The misting fan device as set forth in claim 13 above, wherein said aperture is adapted to accept a sleeve fitted therein, said sleeve having a lower end press fitted within said aperture and an upper end extending upwardly from said aperture, said upper end having at least one lower lip formed on said sleeve and extending laterally outwardly for a distance, each of said front and rear collar bodies having an interior flange formed therein and extending inwardly for a distance, each of said flanges being spaced and positioned such that said flanges will surround said sleeve and overlie said lower lip when said first front half and second rear half body portions are assembled on said neck portion thereby to further secure the joint between said upper body and lower body portions when the misting fan device is assembled.

15. The misting fan device as set forth in claim 14 above, wherein said sleeve further includes an upper lip formed on said sleeve, said upper lip being spaced from said lower lip a short distance, and at least one of said front and rear collar bodies has a securement flange formed thereon and extending inwardly a distance, said securement flange being spaced and positioned such that said securement flange will overlie said upper lip when said first front half and second rear half body portions are assembled on said neck portion.

16. The misting fan device as set forth in claim 14 above, wherein one of said front and rear collar bodies includes a stabilizing flange formed thereon and extending inwardly a distance, said stabilizing flange being spaced and positioned to matingly engage said sleeve when said first and second front and rear half bodies are assembled on said neck portion.

17. The misting fan device as set forth in claim 13 above, wherein said lower body portion is configured to have a support ledge formed immediately below and surrounding said neck portion, said support ledge forming a support surface for supporting said front and rear collar bodies thereon when said first and second front and rear half bodies are assembled on said neck portion.

18. The misting fan device as set forth in claim 13 above, wherein each of said pair of opposed rails is provided with a

central core, each of the cores provided with internal threads, and one of said front and rear collar bodies is provided with access openings, said access openings being in horizontal alignment with said central cores, and said lock means comprises screws which may be inserted through said access

openings and screw-threaded into said central cores to lockingly engage said first and second front and rear body halves together when assembled on said neck portion.

* * * * *

EXHIBIT C

US00D553227S

(12) United States Design Patent

Chen

(10) Patent No.: US D553,227 S
(45) Date of Patent: ** Oct. 16, 2007

(54) **MISTING FAN**

(75) Inventor: **Yung Chen**, Clarendon Hills, IL (US)

(73) Assignee: **GLJ, LLC**, Chicago, IL (US)

(**) Term: **14 Years**

(21) Appl. No.: **29/248,339**

(22) Filed: **Aug. 10, 2006**

(51) **LOC (8) Cl.** **23-03**
(52) **U.S. Cl.** **D23/328**; D23/314
(58) **Field of Classification Search** ..... D23/328, D23/381, 382, 379, 370, 377, 225, 213, 337, D23/332, 335, 411, 226, 228, 413, 371, 13–18, D23/89; D9/307, 436, 522, 575, 300, 685, D9/643, 682, 553; 416/95, 146 R, 63, 244 R, 416/247; 261/28, 30, 82, 89, 90, 24; 239/289, 239/77, 214.25, 222.11, 302, 327, 340, 349, 239/351, 355, 375, 600, 352, 310, 311, 337; 222/333; D28/89, 88, 85, 77; 61/28; 454/370; 34/97; 392/373, 374, 383, 384; D19/43, D19/51, 48
See application file for complete search history.

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Assistant Examiner—Anna K Dworzecka
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(57) **CLAIM**

I claim the ornamental design for a misting fan, as shown and described.

DESCRIPTION

FIG. 1 is a perspective view of the misting fan according to the present design;

FIG. 2 is a front plan view of the present design;

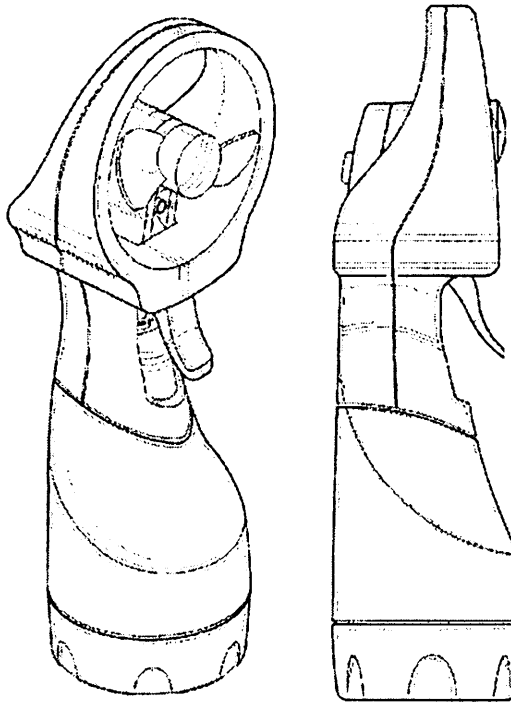
FIG. 3 is a right side view of the present design, a corresponding left side view being a mirror image thereof;

FIG. 4 is a rear plan view of the present design;

FIG. 5 is a bottom plan view of the present design; and,

FIG. 6 is a top view of the present design.

1 Claim, 3 Drawing Sheets



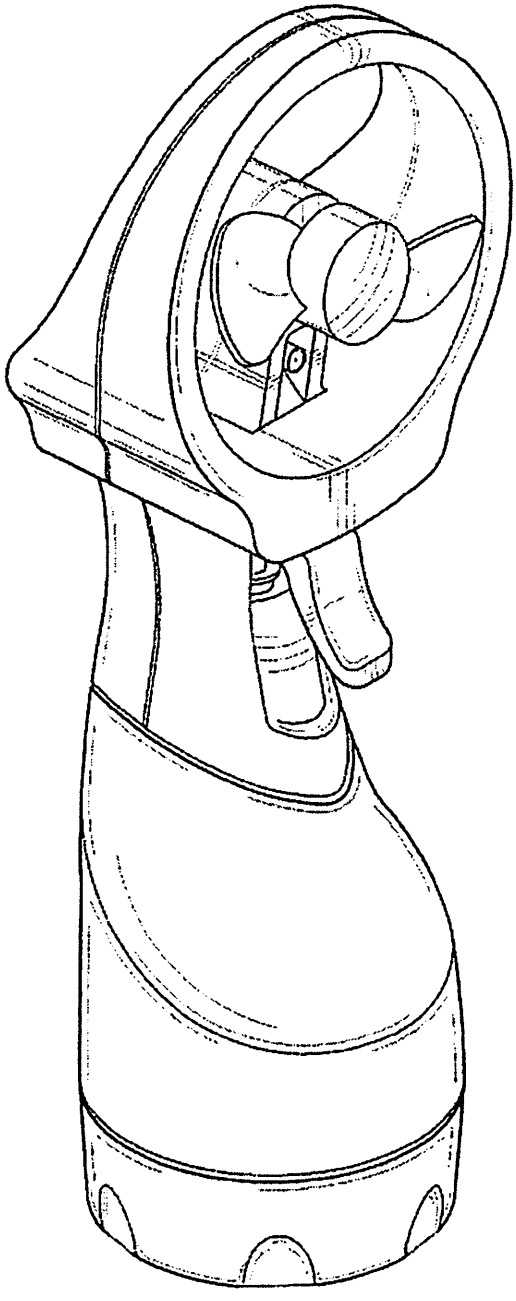


Fig-1

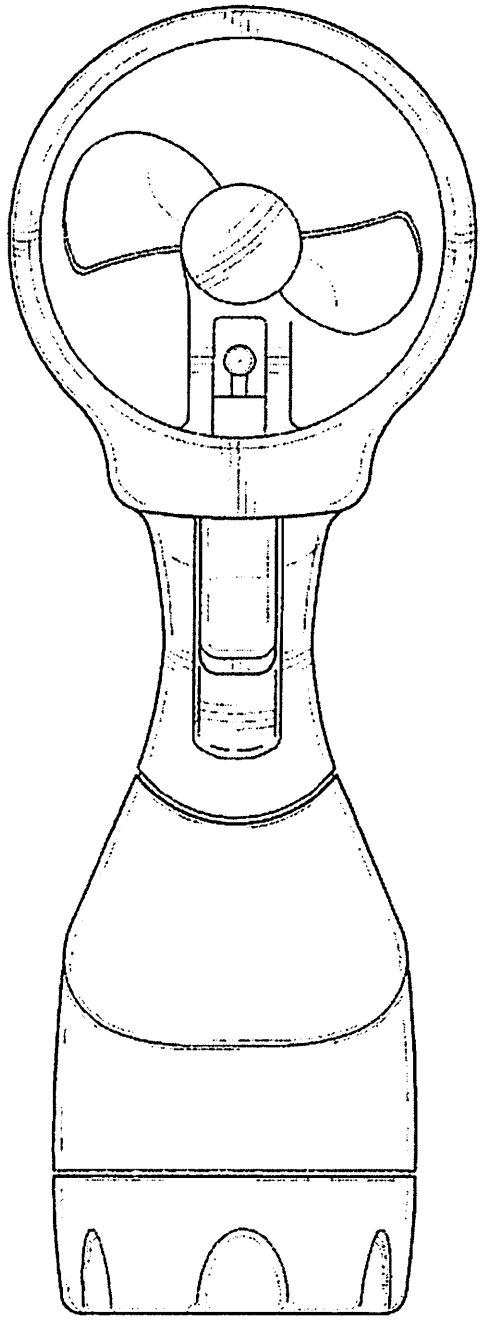


Fig-2

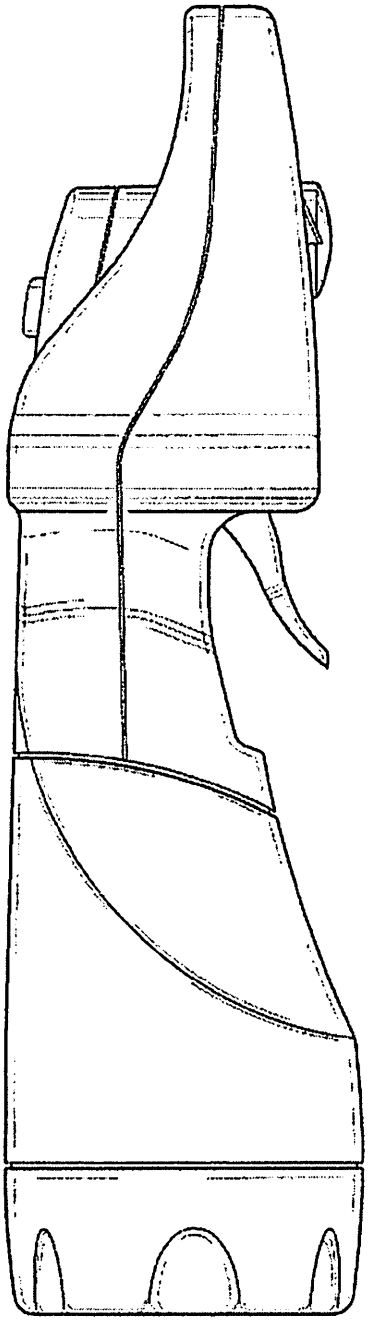


Fig-3

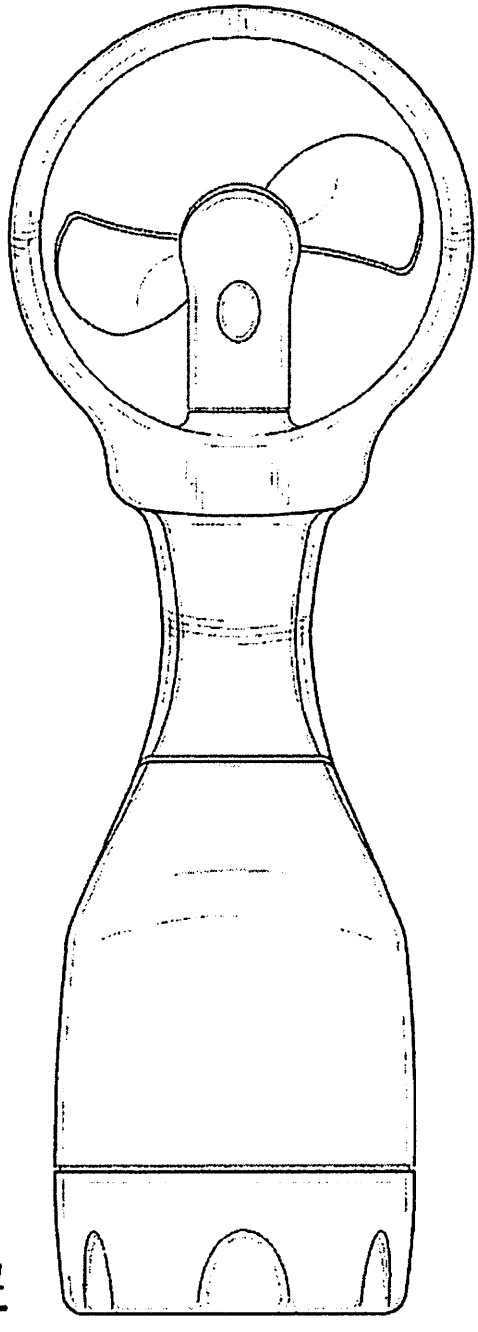


Fig-4

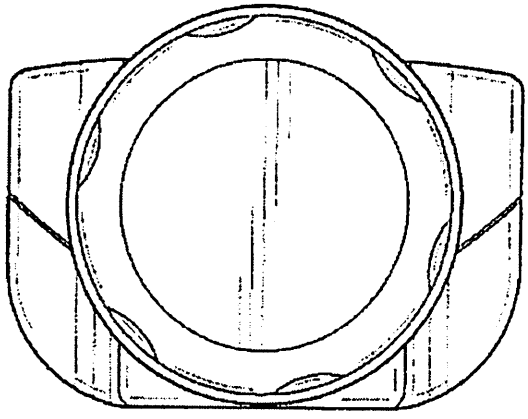


Fig-5

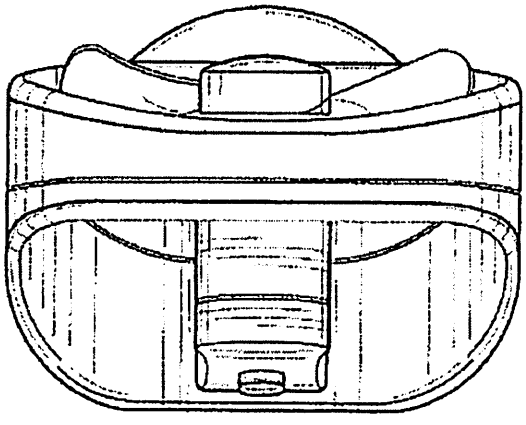


Fig-6

EXHIBIT D

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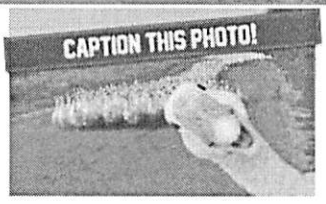
- Thumb activated pump trigger and comfort hand grip
- Reduces air temperature up to 30 degrees
- **Water opening accommodates ice**
- Provides up to 1,000 refreshing mists in one bottle
- Powerful and safe flexible fan blades
- Ideal for sporting events, pools and theme parks
- Uses 2 AA Batteries (Included)

THE HANGOUT



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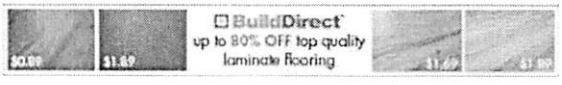

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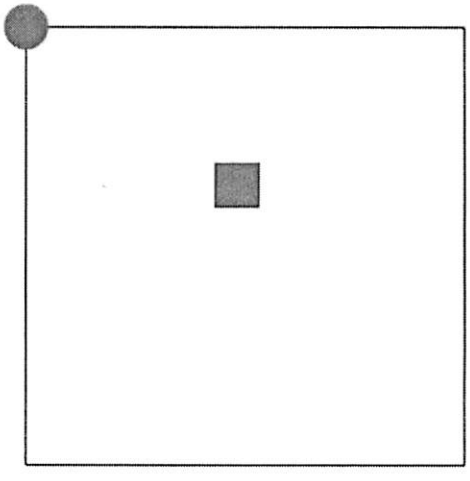

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